GOVERNMENT COLLEGE SATNALI, MAHENDERGARH

Affiliated to IGU, Meerpur, Rewari & Recognised u/s 2(f) of UGC Act

AISHE CODE: C-49467
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E-mail: gcsatnali@yahoo.com
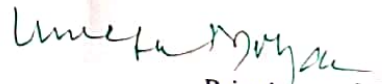
Ref. No. NAAC/SSR/2021/201

Date : 15/11/2021

Certificate

Metric 1.1 Ext. Profile

It is certified that the data of **number of courses offered by the institution across all the programs during the last five years** is true to the best of knowledge. The information is compiled with the record and true to the best of knowledge.

Year	2016-17	2017-18	2018-19	2019-20	2020-21
Number of students	166	166	166	202	202

(NAAC In-Charge)

Principal
Govt. College, Satnali
Government College Satnali
(M/Garh)

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List of courses offered across all programs during the session (2016-17)

Sr. No.	Program code	Program Name	Course code	Course Name	Year of introduction
	1.1 List of courses offered across all programs during the session (2016-17)				
1	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-I	2013
2	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-II	2013
3	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-III	2013
4	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-IV	2013
5	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-V	2013
6	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-VI	2013
7	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-I	2013
8	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-II	2013
9	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-III	2013
10	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-IV	2013
11	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-V	2013
12	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-VI	2013
13	NA	B.A. (PASS-COURSE)	NA	HISTORY OF INDIA (EARLY AGE TO 1200 A.D.)	2013
14	NA	B.A. (PASS-COURSE)	NA	HISTORY OF INDIA (1200 TO 1707 A.D.	2013
15	NA	B.A. (PASS-COURSE)	NA	HISTORY OF MODERN INDIA 1707-1950 A.D.	2013
16	NA	B.A. (PASS-COURSE)	NA	HISTORY OF HARYANA	2013
17	NA	B.A. (PASS-COURSE)	NA	HISTORY OF ANCIENT & MEDIVAL WORLD	2013
18	NA	B.A. (PASS-COURSE)	NA	HISTORY OF MODERN WORLD	2013
19	NA	B.A. (PASS-COURSE)	NA	Geography of India (TH.)	2013
20	NA	B.A. (PASS-COURSE)	NA	Maps and Scales (Pr.)	2013
21	NA	B.A. (PASS-COURSE)	NA	Physical Geography-I (Th.)	2013
22	NA	B.A. (PASS-COURSE)	NA	Representation of physical Features (Pr.)	2013
23	NA	B.A. (PASS-COURSE)	NA	Physical Geography-II (Th.)	2013
24	NA	B.A. (PASS-COURSE)	NA	Representation of Climatic Data(Pr.)	2013
25	NA	B.A. (PASS-COURSE)	NA	Human Geography (Th.)	2013
26	NA	B.A. (PASS-COURSE)	NA	Maps Projections (Pr.)	2013
27	NA	B.A. (PASS-COURSE)	NA	Economic Geography (Th.)	2013
28	NA	B.A. (PASS-COURSE)	NA	Distribution maps and diagrams (Pr.)	2013
29	NA	B.A. (PASS-COURSE)	NA	Intr. to remote Sensing, GIS, Quantitive methods	2013
30	NA	B.A. (PASS-COURSE)	NA	Introduction to R S & Field survey Report (Pr.)	2013
31	NA	B.A. (PASS-COURSE)	NA	Indian Constitution	2013
32	NA	B.A. (PASS-COURSE)	NA	Principles of Political Science III	2013
33	NA	B.A. (PASS-COURSE)	NA	Principles of Political Science IV	2013
34	NA	B.A. (PASS-COURSE)	NA	International organisation V	2013
35	NA	B.A. (PASS-COURSE)	NA	International organisation VI	2013

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36	NA	B.A. (PASS-COURSE)	NA	Micro Economics -I	2013
37	NA	B.A. (PASS-COURSE)	NA	Micro Economics -II	2013
38	NA	B.A. (PASS-COURSE)	NA	Macro Economics -I	2013
39	NA	B.A. (PASS-COURSE)	NA	Macro Economics -II	2013
40	NA	B.A. (PASS-COURSE)	NA	Development Economics	2013
41	NA	B.A. (PASS-COURSE)	NA	International Economics	2013
42	NA	B.A. (PASS-COURSE)	NA	Algebra	2013
43	NA	B.A. (PASS-COURSE)	NA	Calculus	2013
44	NA	B.A. (PASS-COURSE)	NA	Solid Geometry	2013
45	NA	B.A. (PASS-COURSE)	NA	Ordinary Differential Equation	2013
46	NA	B.A. (PASS-COURSE)	NA	Vector Calculus	2013
47	NA	B.A. (PASS-COURSE)	NA	Number Theory & Trigonometry	2013
48	NA	B.A. (PASS-COURSE)	NA	Statistics	2013
49	NA	B.A. (PASS-COURSE)	NA	Advance calculus	2013
50	NA	B.A. (PASS-COURSE)	NA	Partial Differential Equation	2013
51	NA	B.A. (PASS-COURSE)	NA	Sequence And Series	2013
52	NA	B.A. (PASS-COURSE)	NA	Programming in C & Numerical Analysis	2013
53	NA	B.A. (PASS-COURSE)	NA	Special Function & Transforms	2013
54	NA	B.A. (PASS-COURSE)	NA	Group and Rings	2013
55	NA	B.A. (PASS-COURSE)	NA	Numerical Analysis	2013
56	NA	B.A. (PASS-COURSE)	NA	Real Analysis	2013
57	NA	B.A. (PASS-COURSE)	NA	Real And Complex	2013
58	NA	B.A. (PASS-COURSE)	NA	Linear Algebra	2013
59	NA	B.A. (PASS-COURSE)	NA	Dynamics	2013
60	NA	B.A. (PASS-COURSE)	NA	C Practrical	2013
61	NA	B.A. (PASS-COURSE)	NA	Numerical Practical	2013
62	NA	B.COM. (PASS-COURSE)	NA	Financial Accounting -I	2013
63	NA	B.COM. (PASS-COURSE)	NA	Financial Accounting -II	2013
64	NA	B.COM. (PASS-COURSE)	NA	Corporate accounting -I	2013
65	NA	B.COM. (PASS-COURSE)	NA	Corporate accounting -II	2013
66	NA	B.COM. (PASS-COURSE)	NA	Taxation Law -I	2013
67	NA	B.COM. (PASS-COURSE)	NA	Cost Accounting -I	2013
68	NA	B.COM. (PASS-COURSE)	NA	Accounting for management	2013
69	NA	B.COM. (PASS-COURSE)	NA	Taxation Law -II	2013
70	NA	B.COM. (PASS-COURSE)	NA	Cost Accounting -II	2013
71	NA	B.COM. (PASS-COURSE)	NA	Financial Management	2013
72	NA	B.COM. (PASS-COURSE)	NA	Business Mathematics -I	2013
73	NA	B.COM. (PASS-COURSE)	NA	Business Mathematics -II	2013

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74	NA	B.COM. (PASS-COURSE)	NA	Business Statistics -I	2013
75	NA	B.COM. (PASS-COURSE)	NA	Business Statistics -II	2013
76	NA	B.COM. (PASS-COURSE)	NA	Business Economics -I	2013
77	NA	B.COM. (PASS-COURSE)	NA	Business Economics -II	2013
78	NA	B.COM. (PASS-COURSE)	NA	Business Management -I	2013
79	NA	B.COM. (PASS-COURSE)	NA	Business Management -II	2013
80	NA	B.COM. (PASS-COURSE)	NA	Business Communication Skills	2013
81	NA	B.COM. (PASS-COURSE)	NA	Business environment -II	2013
82	NA	B.COM. (PASS-COURSE)	NA	Basics of Computer -I	2013
83	NA	B.COM. (PASS-COURSE)	NA	Basics of computer -II	2013
84	NA	B.COM. (PASS-COURSE)	NA	Business Regulatory & Framework-I	2013
85	NA	B.COM. (PASS-COURSE)	NA	Business Regulatory & Framework-II	2013
86	NA	B.COM. (PASS-COURSE)	NA	Corporate law -I	2013
87	NA	B.COM. (PASS-COURSE)	NA	Corporate law -II	2013
88	NA	B.COM. (PASS-COURSE)	NA	Macro Economics -I	2013
89	NA	B.COM. (PASS-COURSE)	NA	Marketing Management -II	2013
90	NA	B.COM. (PASS-COURSE)	NA	Financial Market Operations	2013
91	NA	B.COM. (PASS-COURSE)	NA	International Marketing	2013
92	NA	B.COM. (PASS-COURSE)	NA	Human Resource Management	2013
93	NA	B.COM. (PASS-COURSE)	NA	Basics of retailing/Fundamentaling of Insourence	2013
94	NA	B.COM. (PASS-COURSE)	NA	Int. Business Environment & International Trade	2013
95	NA	B.COM. (PASS-COURSE)	NA	Secretarial Practices	2013
96	NA	B.COM. (PASS-COURSE)	NA	Auditing	2013
97	NA	B.COM. (PASS-COURSE)	NA	Indirect Taxes	2013
98	NA	B.COM. (PASS-COURSE)	NA	Banking & Banking Law	2013
99	NA	B.SC. (NON-MEDICAL)	NA	Mechanics (Physics)	2015
100	NA	B.SC. (NON-MEDICAL)	NA	Electricity and magnetism(Physics)	2015
101	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-I	2015
102	NA	B.SC. (NON-MEDICAL)	NA	properties of matter kinetic theory and relativity	2015
103	NA	B.SC. (NON-MEDICAL)	NA	Electomagnetic induction and electronic devices	2015
104	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-II	2015
105	NA	B.SC. (NON-MEDICAL)	NA	Optics (I) Physics	2015
106	NA	B.SC. (NON-MEDICAL)	NA	Computer programming and thermodynamics	2015
107	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-III	2015
108	NA	B.SC. (NON-MEDICAL)	NA	Statistical Mechanics (Physics)	2015
109	NA	B.SC. (NON-MEDICAL)	NA	Optics (II) Physics	2015
110	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-IV	2015
111	NA	B.SC. (NON-MEDICAL)	NA	Quantum Mechanics (Physics)	2015
112	NA	B.SC. (NON-MEDICAL)	NA	Solid state Physics	2015

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113	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-V	2015
114	NA	B.SC. (NON-MEDICAL)	NA	Atomic Molecular And Laser Physics	2015
115	NA	B.SC. (NON-MEDICAL)	NA	Nuclear Physics	2015
116	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-VI	2015
117	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry I	2015
118	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry I	2015
119	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry I	2015
120	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical I	2015
121	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry II	2015
122	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry II	2015
123	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry II	2015
124	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical II	2015
125	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry III	2015
126	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry III	2015
127	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry III	2015
128	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical III	2015
129	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry IV	2015
130	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry IV	2015
131	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry IV	2015
132	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical IV	2015
133	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry V	2015
134	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry V	2015
135	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry V	2015
136	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical V	2015
137	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry VI	2015
138	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry VI	2015
139	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry VI	2015
140	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical VI	2015
141	NA	B.SC. (NON-MEDICAL)	NA	Algebra	2015
142	NA	B.SC. (NON-MEDICAL)	NA	Calculus	2015
143	NA	B.SC. (NON-MEDICAL)	NA	Solide Geometry	2015
144	NA	B.SC. (NON-MEDICAL)	NA	Number theory and Trigonometry	2015
145	NA	B.SC. (NON-MEDICAL)	NA	Ordinary Differential Equation	2015
146	NA	B.SC. (NON-MEDICAL)	NA	Vector Calculus	2015
147	NA	B.SC. (NON-MEDICAL)	NA	Advance Calculus	2015
148	NA	B.SC. (NON-MEDICAL)	NA	Partial Differential Equation	2015
149	NA	B.SC. (NON-MEDICAL)	NA	Statics	2015
150	NA	B.SC. (NON-MEDICAL)	NA	Special Function and Transformation	2015
151	NA	B.SC. (NON-MEDICAL)	NA	Sequence and series	2015

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152	NA	B.SC. (NON-MEDICAL)	NA	Programming in C and N.A	2015
153	NA	B.SC. (NON-MEDICAL)	NA	C(Practical)	2015
154	NA	B.SC. (NON-MEDICAL)	NA	Real analysis	2015
155	NA	B.SC. (NON-MEDICAL)	NA	Group and Rings	2015
156	NA	B.SC. (NON-MEDICAL)	NA	Num. Analysis	2015
157	NA	B.SC. (NON-MEDICAL)	NA	Num. Analysis (Practical)	2015
158	NA	B.SC. (NON-MEDICAL)	NA	Real and Complex	2015
159	NA	B.SC. (NON-MEDICAL)	NA	Linear algebra	2015
160	NA	B.SC. (NON-MEDICAL)	NA	Dynamics	2015
161	NA	B.SC. (NON-MEDICAL)	NA	Chronical of Times	2015
162	NA	B.SC. (NON-MEDICAL)	NA	Ideas Aglow	2015
163	NA	B.SC. (NON-MEDICAL)	NA	Environmental Studies I	2015
164	NA	B.SC. (NON-MEDICAL)	NA	Environmental Studies II	2015
165	NA	B.SC. (NON-MEDICAL)	NA	Hindi I / Sanskrit I	2015
166	NA	B.SC. (NON-MEDICAL)	NA	Hindi II / Sanskrit II	2015

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List of courses offered across all programs during the session (2017-18)

	1.1 List of courses offered across all programs during the session (2017-18)				
Sr. No.	Program code	Program Name	Course code	Course Name	Year of introduction
1	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-I	2013
2	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-II	2013
3	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-III	2013
4	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-IV	2013
5	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-V	2013
6	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-VI	2013
7	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-I	2013
8	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-II	2013
9	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-III	2013
10	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-IV	2013
11	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-V	2013
12	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-VI	2013
13	NA	B.A. (PASS-COURSE)	NA	HISTORY OF INDIA (EARLY AGE TO 1200 A.D.)	2013
14	NA	B.A. (PASS-COURSE)	NA	HISTORY OF INDIA (1200 TO 1707 A.D.	2013
15	NA	B.A. (PASS-COURSE)	NA	HISTORY OF MODERN INDIA 1707-1950 A.D.	2013
16	NA	B.A. (PASS-COURSE)	NA	HISTORY OF HARYANA	2013
17	NA	B.A. (PASS-COURSE)	NA	HISTORY OF ANCIENT & MEDIVAL WORLD	2013
18	NA	B.A. (PASS-COURSE)	NA	HISTORY OF MODERN WORLD	2013
19	NA	B.A. (PASS-COURSE)	NA	Geography of India (TH.)	2013
20	NA	B.A. (PASS-COURSE)	NA	Maps and Scales (Pr.)	2013
21	NA	B.A. (PASS-COURSE)	NA	Physical Geography-I (Th.)	2013
22	NA	B.A. (PASS-COURSE)	NA	Representation of physical Features (Pr.)	2013
23	NA	B.A. (PASS-COURSE)	NA	Physical Geography-II (Th.)	2013
24	NA	B.A. (PASS-COURSE)	NA	Representation of Climatic Data(Pr.)	2013
25	NA	B.A. (PASS-COURSE)	NA	Human Geography (Th.)	2013
26	NA	B.A. (PASS-COURSE)	NA	Maps Projections (Pr.)	2013
27	NA	B.A. (PASS-COURSE)	NA	Economic Geography (Th.)	2013
28	NA	B.A. (PASS-COURSE)	NA	Distribution maps and diagrams (Pr.)	2013
29	NA	B.A. (PASS-COURSE)	NA	Intr. to remote Sensing, GIS, Quantitive methods	2013
30	NA	B.A. (PASS-COURSE)	NA	Introduction to R S & Field survey Report (Pr.)	2013
31	NA	B.A. (PASS-COURSE)	NA	Indian Constitution	2013
32	NA	B.A. (PASS-COURSE)	NA	Principles of Political Science III	2013
33	NA	B.A. (PASS-COURSE)	NA	Principles of Political Science IV	2013
34	NA	B.A. (PASS-COURSE)	NA	International organisation V	2013
35	NA	B.A. (PASS-COURSE)	NA	International organisation VI	2013

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36	NA	B.A. (PASS-COURSE)	NA	Micro Economics -I	2013
37	NA	B.A. (PASS-COURSE)	NA	Micro Economics -II	2013
38	NA	B.A. (PASS-COURSE)	NA	Macro Economics -I	2013
39	NA	B.A. (PASS-COURSE)	NA	Macro Economics -II	2013
40	NA	B.A. (PASS-COURSE)	NA	Development Economics	2013
41	NA	B.A. (PASS-COURSE)	NA	International Economics	2013
42	NA	B.A. (PASS-COURSE)	NA	Algebra	2013
43	NA	B.A. (PASS-COURSE)	NA	Calculus	2013
44	NA	B.A. (PASS-COURSE)	NA	Solid Geometry	2013
45	NA	B.A. (PASS-COURSE)	NA	Ordinary Differential Equation	2013
46	NA	B.A. (PASS-COURSE)	NA	Vector Calculus	2013
47	NA	B.A. (PASS-COURSE)	NA	Number Theory & Trigonometry	2013
48	NA	B.A. (PASS-COURSE)	NA	Statistics	2013
49	NA	B.A. (PASS-COURSE)	NA	Advance calculus	2013
50	NA	B.A. (PASS-COURSE)	NA	Partial Differential Equation	2013
51	NA	B.A. (PASS-COURSE)	NA	Sequence And Series	2013
52	NA	B.A. (PASS-COURSE)	NA	Programming in C & Numerical Analysis	2013
53	NA	B.A. (PASS-COURSE)	NA	Special Function & Transforms	2013
54	NA	B.A. (PASS-COURSE)	NA	Group and Rings	2013
55	NA	B.A. (PASS-COURSE)	NA	Numerical Analysis	2013
56	NA	B.A. (PASS-COURSE)	NA	Real Analysis	2013
57	NA	B.A. (PASS-COURSE)	NA	Real And Complex	2013
58	NA	B.A. (PASS-COURSE)	NA	Linear Algebra	2013
59	NA	B.A. (PASS-COURSE)	NA	Dynamics	2013
60	NA	B.A. (PASS-COURSE)	NA	C Practrical	2013
61	NA	B.A. (PASS-COURSE)	NA	Numerical Practical	2013
62	NA	B.COM. (PASS-COURSE)	NA	Financial Accounting -I	2013
63	NA	B.COM. (PASS-COURSE)	NA	Financial Accounting -II	2013
64	NA	B.COM. (PASS-COURSE)	NA	Corporate accounting -I	2013
65	NA	B.COM. (PASS-COURSE)	NA	Corporate accounting -II	2013
66	NA	B.COM. (PASS-COURSE)	NA	Taxation Law -I	2013
67	NA	B.COM. (PASS-COURSE)	NA	Cost Accounting -I	2013
68	NA	B.COM. (PASS-COURSE)	NA	Accounting for management	2013
69	NA	B.COM. (PASS-COURSE)	NA	Taxation Law -II	2013
70	NA	B.COM. (PASS-COURSE)	NA	Cost Accounting -II	2013
71	NA	B.COM. (PASS-COURSE)	NA	Financial Management	2013
72	NA	B.COM. (PASS-COURSE)	NA	Business Mathematics -I	2013
73	NA	B.COM. (PASS-COURSE)	NA	Business Mathematics -II	2013
74	NA	B.COM. (PASS-COURSE)	NA	Business Statistics -I	2013

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75	NA	B.COM. (PASS-COURSE)	NA	Business Statistics -II	2013
76	NA	B.COM. (PASS-COURSE)	NA	Business Economics -I	2013
77	NA	B.COM. (PASS-COURSE)	NA	Business Economics -II	2013
78	NA	B.COM. (PASS-COURSE)	NA	Business Management -I	2013
79	NA	B.COM. (PASS-COURSE)	NA	Business Management -II	2013
80	NA	B.COM. (PASS-COURSE)	NA	Business Communication Skills	2013
81	NA	B.COM. (PASS-COURSE)	NA	Business environment -II	2013
82	NA	B.COM. (PASS-COURSE)	NA	Basics of Computer -I	2013
83	NA	B.COM. (PASS-COURSE)	NA	Basics of computer -II	2013
84	NA	B.COM. (PASS-COURSE)	NA	Business Regulatory & Framework-I	2013
85	NA	B.COM. (PASS-COURSE)	NA	Business Regulatory & Framework-II	2013
86	NA	B.COM. (PASS-COURSE)	NA	Corporate law -I	2013
87	NA	B.COM. (PASS-COURSE)	NA	Corporate law -II	2013
88	NA	B.COM. (PASS-COURSE)	NA	Macro Economics -I	2013
89	NA	B.COM. (PASS-COURSE)	NA	Marketing Management -II	2013
90	NA	B.COM. (PASS-COURSE)	NA	Financial Market Operations	2013
91	NA	B.COM. (PASS-COURSE)	NA	International Marketing	2013
92	NA	B.COM. (PASS-COURSE)	NA	Human Resource Management	2013
93	NA	B.COM. (PASS-COURSE)	NA	Basics of retailing/Fundamentaling of Insourence	2013
94	NA	B.COM. (PASS-COURSE)	NA	Int. Business Environment & International Trade	2013
95	NA	B.COM. (PASS-COURSE)	NA	Secretarial Practices	2013
96	NA	B.COM. (PASS-COURSE)	NA	Auditing	2013
97	NA	B.COM. (PASS-COURSE)	NA	Indirect Taxes	2013
98	NA	B.COM. (PASS-COURSE)	NA	Banking & Banking Law	2013
99	NA	B.SC. (NON-MEDICAL)	NA	Mechanics (Physics)	2015
100	NA	B.SC. (NON-MEDICAL)	NA	Electricity and magnetism(Physics)	2015
101	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-I	2015
102	NA	B.SC. (NON-MEDICAL)	NA	properties of matter kinetic theory and relativity	2015
103	NA	B.SC. (NON-MEDICAL)	NA	Electomagnetic induction and electronic devices	2015
104	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-II	2015
105	NA	B.SC. (NON-MEDICAL)	NA	Optics (I) Physics	2015
106	NA	B.SC. (NON-MEDICAL)	NA	Computer programming and thermodynamics	2015
107	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-III	2015
108	NA	B.SC. (NON-MEDICAL)	NA	Statistical Mechanics (Physics)	2015
109	NA	B.SC. (NON-MEDICAL)	NA	Optics (II) Physics	2015
110	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-IV	2015
111	NA	B.SC. (NON-MEDICAL)	NA	Quantum Mechanics (Physics)	2015
112	NA	B.SC. (NON-MEDICAL)	NA	Solid state Physics	2015
113	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-V	2015

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114	NA	B.SC. (NON-MEDICAL)	NA	Atomic Molecular And Laser Physics	2015
115	NA	B.SC. (NON-MEDICAL)	NA	Nuclear Physics	2015
116	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-VI	2015
117	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry I	2015
118	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry I	2015
119	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry I	2015
120	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical I	2015
121	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry II	2015
122	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry II	2015
123	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry II	2015
124	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical II	2015
125	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry III	2015
126	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry III	2015
127	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry III	2015
128	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical III	2015
129	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry IV	2015
130	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry IV	2015
131	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry IV	2015
132	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical IV	2015
133	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry V	2015
134	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry V	2015
135	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry V	2015
136	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical V	2015
137	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry VI	2015
138	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry VI	2015
139	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry VI	2015
140	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical VI	2015
141	NA	B.SC. (NON-MEDICAL)	NA	Algebra	2015
142	NA	B.SC. (NON-MEDICAL)	NA	Calculus	2015
143	NA	B.SC. (NON-MEDICAL)	NA	Solide Geometry	2015
144	NA	B.SC. (NON-MEDICAL)	NA	Number theory and Trigonometry	2015
145	NA	B.SC. (NON-MEDICAL)	NA	Ordinary Differential Equation	2015
146	NA	B.SC. (NON-MEDICAL)	NA	Vector Calculus	2015
147	NA	B.SC. (NON-MEDICAL)	NA	Advance Calculus	2015
148	NA	B.SC. (NON-MEDICAL)	NA	Partial Differential Equation	2015
149	NA	B.SC. (NON-MEDICAL)	NA	Statics	2015
150	NA	B.SC. (NON-MEDICAL)	NA	Special Function and Transformation	2015
151	NA	B.SC. (NON-MEDICAL)	NA	Sequence and series	2015
152	NA	B.SC. (NON-MEDICAL)	NA	Programming in C and N.A	2015

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153	NA	B.SC. (NON-MEDICAL)	NA	C(Practical)	2015
154	NA	B.SC. (NON-MEDICAL)	NA	Real analysis	2015
155	NA	B.SC. (NON-MEDICAL)	NA	Group and Rings	2015
156	NA	B.SC. (NON-MEDICAL)	NA	Num. Analysis	2015
157	NA	B.SC. (NON-MEDICAL)	NA	Num. Analysis (Practical)	2015
158	NA	B.SC. (NON-MEDICAL)	NA	Real and Complex	2015
159	NA	B.SC. (NON-MEDICAL)	NA	Linear algebra	2015
160	NA	B.SC. (NON-MEDICAL)	NA	Dynamics	2015
161	NA	B.SC. (NON-MEDICAL)	NA	Chronical of Times	2015
162	NA	B.SC. (NON-MEDICAL)	NA	Ideas Aglow	2015
163	NA	B.SC. (NON-MEDICAL)	NA	Environmental Studies I	2015
164	NA	B.SC. (NON-MEDICAL)	NA	Environmental Studies II	2015
165	NA	B.SC. (NON-MEDICAL)	NA	Hindi I / Sanskrit I	2015
166	NA	B.SC. (NON-MEDICAL)	NA	Hindi II / Sanskrit II	2015

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List of courses offered across all programs during the session (2018-19)

	1.1 List of courses offered across all programs during the session (2018-19)				
Sr. No.	Program code	Program Name	Course code	Course Name	Year of introduction
1	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-I	2013
2	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-II	2013
3	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-III	2013
4	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-IV	2013
5	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-V	2013
6	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-VI	2013
7	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-I	2013
8	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-II	2013
9	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-III	2013
10	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-IV	2013
11	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-V	2013
12	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-VI	2013
13	NA	B.A. (PASS-COURSE)	NA	HISTORY OF INDIA (EARLY AGE TO 1200 A.D.)	2013
14	NA	B.A. (PASS-COURSE)	NA	HISTORY OF INDIA (1200 TO 1707 A.D.	2013
15	NA	B.A. (PASS-COURSE)	NA	HISTORY OF MODERN INDIA 1707-1950 A.D.	2013
16	NA	B.A. (PASS-COURSE)	NA	HISTORY OF HARYANA	2013
17	NA	B.A. (PASS-COURSE)	NA	HISTORY OF ANCIENT & MEDIVAL WORLD	2013
18	NA	B.A. (PASS-COURSE)	NA	HISTORY OF MODERN WORLD	2013
19	NA	B.A. (PASS-COURSE)	NA	Geography of India (TH.)	2013
20	NA	B.A. (PASS-COURSE)	NA	Maps and Scales (Pr.)	2013
21	NA	B.A. (PASS-COURSE)	NA	Physical Geography-I (Th.)	2013
22	NA	B.A. (PASS-COURSE)	NA	Representation of physical Features (Pr.)	2013
23	NA	B.A. (PASS-COURSE)	NA	Physical Geography-II (Th.)	2013
24	NA	B.A. (PASS-COURSE)	NA	Representation of Climatic Data(Pr.)	2013
25	NA	B.A. (PASS-COURSE)	NA	Human Geography (Th.)	2013
26	NA	B.A. (PASS-COURSE)	NA	Maps Projections (Pr.)	2013
27	NA	B.A. (PASS-COURSE)	NA	Economic Geography (Th.)	2013
28	NA	B.A. (PASS-COURSE)	NA	Distribution maps and diagrams (Pr.)	2013
29	NA	B.A. (PASS-COURSE)	NA	Intr. to remote Sensing, GIS, Quantitive methods	2013
30	NA	B.A. (PASS-COURSE)	NA	Introduction to R S & Field survey Report (Pr.)	2013
31	NA	B.A. (PASS-COURSE)	NA	Indian Constitution	2013
32	NA	B.A. (PASS-COURSE)	NA	Principles of Political Science III	2013
33	NA	B.A. (PASS-COURSE)	NA	Principles of Political Science IV	2013
34	NA	B.A. (PASS-COURSE)	NA	International organisation V	2013
35	NA	B.A. (PASS-COURSE)	NA	International organisation VI	2013

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36	NA	B.A. (PASS-COURSE)	NA	Micro Economics -I	2013
37	NA	B.A. (PASS-COURSE)	NA	Micro Economics -II	2013
38	NA	B.A. (PASS-COURSE)	NA	Macro Economics -I	2013
39	NA	B.A. (PASS-COURSE)	NA	Macro Economics -II	2013
40	NA	B.A. (PASS-COURSE)	NA	Development Economics	2013
41	NA	B.A. (PASS-COURSE)	NA	International Economics	2013
42	NA	B.A. (PASS-COURSE)	NA	Algebra	2013
43	NA	B.A. (PASS-COURSE)	NA	Calculus	2013
44	NA	B.A. (PASS-COURSE)	NA	Solid Geometry	2013
45	NA	B.A. (PASS-COURSE)	NA	Ordinary Differential Equation	2013
46	NA	B.A. (PASS-COURSE)	NA	Vector Calculus	2013
47	NA	B.A. (PASS-COURSE)	NA	Number Theory & Trigonometry	2013
48	NA	B.A. (PASS-COURSE)	NA	Statistics	2013
49	NA	B.A. (PASS-COURSE)	NA	Advance calculus	2013
50	NA	B.A. (PASS-COURSE)	NA	Partial Differential Equation	2013
51	NA	B.A. (PASS-COURSE)	NA	Sequence And Series	2013
52	NA	B.A. (PASS-COURSE)	NA	Programming in C & Numerical Analysis	2013
53	NA	B.A. (PASS-COURSE)	NA	Special Function & Transforms	2013
54	NA	B.A. (PASS-COURSE)	NA	Group and Rings	2013
55	NA	B.A. (PASS-COURSE)	NA	Numerical Analysis	2013
56	NA	B.A. (PASS-COURSE)	NA	Real Analysis	2013
57	NA	B.A. (PASS-COURSE)	NA	Real And Complex	2013
58	NA	B.A. (PASS-COURSE)	NA	Linear Algebra	2013
59	NA	B.A. (PASS-COURSE)	NA	Dynamics	2013
60	NA	B.A. (PASS-COURSE)	NA	C Practrical	2013
61	NA	B.A. (PASS-COURSE)	NA	Numerical Practical	2013
62	NA	B.COM. (PASS-COURSE)	NA	Financial Accounting -I	2013
63	NA	B.COM. (PASS-COURSE)	NA	Financial Accounting -II	2013
64	NA	B.COM. (PASS-COURSE)	NA	Corporate accounting -I	2013
65	NA	B.COM. (PASS-COURSE)	NA	Corporate accounting -II	2013
66	NA	B.COM. (PASS-COURSE)	NA	Taxation Law -I	2013
67	NA	B.COM. (PASS-COURSE)	NA	Cost Accounting -I	2013
68	NA	B.COM. (PASS-COURSE)	NA	Accounting for management	2013
69	NA	B.COM. (PASS-COURSE)	NA	Taxation Law -II	2013
70	NA	B.COM. (PASS-COURSE)	NA	Cost Accounting -II	2013
71	NA	B.COM. (PASS-COURSE)	NA	Financial Management	2013
72	NA	B.COM. (PASS-COURSE)	NA	Business Mathematics -I	2013
73	NA	B.COM. (PASS-COURSE)	NA	Business Mathematics -II	2013
74	NA	B.COM. (PASS-COURSE)	NA	Business Statistics -I	2013

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75	NA	B.COM. (PASS-COURSE)	NA	Business Statistics -II	2013
76	NA	B.COM. (PASS-COURSE)	NA	Business Economics -I	2013
77	NA	B.COM. (PASS-COURSE)	NA	Business Economics -II	2013
78	NA	B.COM. (PASS-COURSE)	NA	Business Management -I	2013
79	NA	B.COM. (PASS-COURSE)	NA	Business Management -II	2013
80	NA	B.COM. (PASS-COURSE)	NA	Business Communication Skills	2013
81	NA	B.COM. (PASS-COURSE)	NA	Business environment -II	2013
82	NA	B.COM. (PASS-COURSE)	NA	Basics of Computer -I	2013
83	NA	B.COM. (PASS-COURSE)	NA	Basics of computer -II	2013
84	NA	B.COM. (PASS-COURSE)	NA	Business Regulatory & Framework-I	2013
85	NA	B.COM. (PASS-COURSE)	NA	Business Regulatory & Framework-II	2013
86	NA	B.COM. (PASS-COURSE)	NA	Corporate law -I	2013
87	NA	B.COM. (PASS-COURSE)	NA	Corporate law -II	2013
88	NA	B.COM. (PASS-COURSE)	NA	Macro Economics -I	2013
89	NA	B.COM. (PASS-COURSE)	NA	Marketing Management -II	2013
90	NA	B.COM. (PASS-COURSE)	NA	Financial Market Operations	2013
91	NA	B.COM. (PASS-COURSE)	NA	International Marketing	2013
92	NA	B.COM. (PASS-COURSE)	NA	Human Resource Management	2013
93	NA	B.COM. (PASS-COURSE)	NA	Basics of retailing/Fundamentaling of Insourence	2013
94	NA	B.COM. (PASS-COURSE)	NA	Int. Business Environment & International Trade	2013
95	NA	B.COM. (PASS-COURSE)	NA	Secretarial Practices	2013
96	NA	B.COM. (PASS-COURSE)	NA	Auditing	2013
97	NA	B.COM. (PASS-COURSE)	NA	Indirect Taxes	2013
98	NA	B.COM. (PASS-COURSE)	NA	Banking & Banking Law	2013
99	NA	B.SC. (NON-MEDICAL)	NA	Mechanics (Physics)	2015
100	NA	B.SC. (NON-MEDICAL)	NA	Electricity and magnetism(Physics)	2015
101	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-I	2015
102	NA	B.SC. (NON-MEDICAL)	NA	properties of matter kinetic theory and relativity	2015
103	NA	B.SC. (NON-MEDICAL)	NA	Electomagnetic induction and electronic devices	2015
104	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-II	2015
105	NA	B.SC. (NON-MEDICAL)	NA	Optics (I) Physics	2015
106	NA	B.SC. (NON-MEDICAL)	NA	Computer programming and thermodynamics	2015
107	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-III	2015
108	NA	B.SC. (NON-MEDICAL)	NA	Statistical Mechanics (Physics)	2015
109	NA	B.SC. (NON-MEDICAL)	NA	Optics (II) Physics	2015
110	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-IV	2015
111	NA	B.SC. (NON-MEDICAL)	NA	Quantum Mechanics (Physics)	2015
112	NA	B.SC. (NON-MEDICAL)	NA	Solid state Physics	2015
113	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-V	2015

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114	NA	B.SC. (NON-MEDICAL)	NA	Atomic Molecular And Laser Physics	2015
115	NA	B.SC. (NON-MEDICAL)	NA	Nuclear Physics	2015
116	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-VI	2015
117	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry I	2015
118	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry I	2015
119	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry I	2015
120	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical I	2015
121	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry II	2015
122	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry II	2015
123	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry II	2015
124	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical II	2015
125	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry III	2015
126	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry III	2015
127	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry III	2015
128	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical III	2015
129	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry IV	2015
130	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry IV	2015
131	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry IV	2015
132	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical IV	2015
133	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry V	2015
134	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry V	2015
135	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry V	2015
136	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical V	2015
137	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry VI	2015
138	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry VI	2015
139	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry VI	2015
140	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical VI	2015
141	NA	B.SC. (NON-MEDICAL)	NA	Algebra	2015
142	NA	B.SC. (NON-MEDICAL)	NA	Calculus	2015
143	NA	B.SC. (NON-MEDICAL)	NA	Solide Geometry	2015
144	NA	B.SC. (NON-MEDICAL)	NA	Number theory and Trigonometry	2015
145	NA	B.SC. (NON-MEDICAL)	NA	Ordinary Differential Equation	2015
146	NA	B.SC. (NON-MEDICAL)	NA	Vector Calculus	2015
147	NA	B.SC. (NON-MEDICAL)	NA	Advance Calculus	2015
148	NA	B.SC. (NON-MEDICAL)	NA	Partial Differential Equation	2015
149	NA	B.SC. (NON-MEDICAL)	NA	Statics	2015
150	NA	B.SC. (NON-MEDICAL)	NA	Special Function and Transformation	2015
151	NA	B.SC. (NON-MEDICAL)	NA	Sequence and series	2015
152	NA	B.SC. (NON-MEDICAL)	NA	Programming in C and N.A	2015

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153	NA	B.SC. (NON-MEDICAL)	NA	C(Practical)	2015
154	NA	B.SC. (NON-MEDICAL)	NA	Real analysis	2015
155	NA	B.SC. (NON-MEDICAL)	NA	Group and Rings	2015
156	NA	B.SC. (NON-MEDICAL)	NA	Num. Analysis	2015
157	NA	B.SC. (NON-MEDICAL)	NA	Num. Analysis (Practical)	2015
158	NA	B.SC. (NON-MEDICAL)	NA	Real and Complex	2015
159	NA	B.SC. (NON-MEDICAL)	NA	Linear algebra	2015
160	NA	B.SC. (NON-MEDICAL)	NA	Dynamics	2015
161	NA	B.SC. (NON-MEDICAL)	NA	Chronical of Times	2015
162	NA	B.SC. (NON-MEDICAL)	NA	Ideas Aglow	2015
163	NA	B.SC. (NON-MEDICAL)	NA	Environmental Studies I	2015
164	NA	B.SC. (NON-MEDICAL)	NA	Environmental Studies II	2015
165	NA	B.SC. (NON-MEDICAL)	NA	Hindi I / Sanskrit I	2015
166	NA	B.SC. (NON-MEDICAL)	NA	Hindi II / Sanskrit II	2015

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List of courses offered across all programs during the session (2019-20)

Sr. No.	Program code	Program Name	Course code	Course Name	Year of introduction
		1.1 List of courses offered across all programs during the session (2019-20)			
1	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-I	2013
2	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-II	2013
3	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-III	2013
4	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-IV	2013
5	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-V	2013
6	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-VI	2013
7	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-I	2013
8	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-II	2013
9	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-III	2013
10	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-IV	2013
11	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-V	2013
12	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-VI	2013
13	NA	B.A. (PASS-COURSE)	NA	HISTORY OF INDIA (EARLY AGE TO 1200 A.D.)	2013
14	NA	B.A. (PASS-COURSE)	NA	HISTORY OF INDIA (1200 TO 1707 A.D.	2013
15	NA	B.A. (PASS-COURSE)	NA	HISTORY OF MODERN INDIA 1707-1950 A.D.	2013
16	NA	B.A. (PASS-COURSE)	NA	HISTORY OF HARYANA	2013
17	NA	B.A. (PASS-COURSE)	NA	HISTORY OF ANCIENT & MEDIVAL WORLD	2013
18	NA	B.A. (PASS-COURSE)	NA	HISTORY OF MODERN WORLD	2013
19	NA	B.A. (PASS-COURSE)	NA	Geography of India (TH.)	2013
20	NA	B.A. (PASS-COURSE)	NA	Maps and Scales (Pr.)	2013
21	NA	B.A. (PASS-COURSE)	NA	Physical Geography-I (Th.)	2013
22	NA	B.A. (PASS-COURSE)	NA	Representation of physical Features (Pr.)	2013
23	NA	B.A. (PASS-COURSE)	NA	Physical Geography-II (Th.)	2013
24	NA	B.A. (PASS-COURSE)	NA	Representation of Climatic Data(Pr.)	2013
25	NA	B.A. (PASS-COURSE)	NA	Human Geography (Th.)	2013
26	NA	B.A. (PASS-COURSE)	NA	Maps Projections (Pr.)	2013
27	NA	B.A. (PASS-COURSE)	NA	Economic Geography(Th.)	2013
28	NA	B.A. (PASS-COURSE)	NA	Distribution maps and diagrams (Pr.)	2013
29	NA	B.A. (PASS-COURSE)	NA	Introduction to remote Sensing,GIS,Quantitive methods	2013
30	NA	B.A. (PASS-COURSE)	NA	Introduction to R S & Field survey Report (Pr.)	2013
31	NA	B.A. (PASS-COURSE)	NA	Indian Constitution	2013
32	NA	B.A. (PASS-COURSE)	NA	Principles of Political Science III	2013
33	NA	B.A. (PASS-COURSE)	NA	Principles of Political Science IV	2013
34	NA	B.A. (PASS-COURSE)	NA	International organisation V	2013

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35	NA	B.A. (PASS-COURSE)	NA	International organisation VI	2013
36	NA	B.A. (PASS-COURSE)	NA	Micro Economics -I	2013
37	NA	B.A. (PASS-COURSE)	NA	Micro Economics -II	2013
38	NA	B.A. (PASS-COURSE)	NA	Macro Economics -I	2013
39	NA	B.A. (PASS-COURSE)	NA	Macro Economics -II	2013
40	NA	B.A. (PASS-COURSE)	NA	Development Economics	2013
41	NA	B.A. (PASS-COURSE)	NA	International Economics	2013
42	NA	B.A. (PASS-COURSE)	NA	Algebra	2013
43	NA	B.A. (PASS-COURSE)	NA	Calculus	2013
44	NA	B.A. (PASS-COURSE)	NA	Solid Geometry	2013
45	NA	B.A. (PASS-COURSE)	NA	Ordinary Differential Equation	2013
46	NA	B.A. (PASS-COURSE)	NA	Vector Calculus	2013
47	NA	B.A. (PASS-COURSE)	NA	Number Theory & Trigonometry	2013
48	NA	B.A. (PASS-COURSE)	NA	Statistics	2013
49	NA	B.A. (PASS-COURSE)	NA	Advance calculus	2013
50	NA	B.A. (PASS-COURSE)	NA	Partial Differential Equation	2013
51	NA	B.A. (PASS-COURSE)	NA	Sequence And Series	2013
52	NA	B.A. (PASS-COURSE)	NA	Programming in C & Numerical Analysis	2013
53	NA	B.A. (PASS-COURSE)	NA	Special Function & Transforms	2013
54	NA	B.A. (PASS-COURSE)	NA	Group and Rings	2013
55	NA	B.A. (PASS-COURSE)	NA	Numerical Analysis	2013
56	NA	B.A. (PASS-COURSE)	NA	Real Analysis	2013
57	NA	B.A. (PASS-COURSE)	NA	Real And Complex	2013
58	NA	B.A. (PASS-COURSE)	NA	Linear Algebra	2013
59	NA	B.A. (PASS-COURSE)	NA	Dynamics	2013
60	NA	B.A. (PASS-COURSE)	NA	C Practrical	2013
61	NA	B.A. (PASS-COURSE)	NA	Numerical Practical	2013
62	NA	B.COM. (PASS-COURSE)	NA	Financial Accounting -I	2013
63	NA	B.COM. (PASS-COURSE)	NA	Financial Accounting -II	2013
64	NA	B.COM. (PASS-COURSE)	NA	Corporate accounting -I	2013
65	NA	B.COM. (PASS-COURSE)	NA	Corporate accounting -II	2013
66	NA	B.COM. (PASS-COURSE)	NA	Taxation Law -I	2013
67	NA	B.COM. (PASS-COURSE)	NA	Cost Accounting -I	2013
68	NA	B.COM. (PASS-COURSE)	NA	Accounting for management	2013
69	NA	B.COM. (PASS-COURSE)	NA	Taxation Law -II	2013
70	NA	B.COM. (PASS-COURSE)	NA	Cost Accounting -II	2013
71	NA	B.COM. (PASS-COURSE)	NA	Financial Management	2013
72	NA	B.COM. (PASS-COURSE)	NA	Business Mathematics -I	2013
73	NA	B.COM. (PASS-COURSE)	NA	Business Mathematics -II	2013

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74	NA	B.COM. (PASS-COURSE)	NA	Business Statistics -I	2013
75	NA	B.COM. (PASS-COURSE)	NA	Business Statistics -II	2013
76	NA	B.COM. (PASS-COURSE)	NA	Business Economics -I	2013
77	NA	B.COM. (PASS-COURSE)	NA	Business Economics -II	2013
78	NA	B.COM. (PASS-COURSE)	NA	Business Management -I	2013
79	NA	B.COM. (PASS-COURSE)	NA	Business Management -II	2013
80	NA	B.COM. (PASS-COURSE)	NA	Business Communication Skills	2013
81	NA	B.COM. (PASS-COURSE)	NA	Business environment -II	2013
82	NA	B.COM. (PASS-COURSE)	NA	Basics of Computer -I	2013
83	NA	B.COM. (PASS-COURSE)	NA	Basics of computer -II	2013
84	NA	B.COM. (PASS-COURSE)	NA	Business Regulatory & Framework-I	2013
85	NA	B.COM. (PASS-COURSE)	NA	Business Regulatory & Framework-II	2013
86	NA	B.COM. (PASS-COURSE)	NA	Corporate law -I	2013
87	NA	B.COM. (PASS-COURSE)	NA	Corporate law -II	2013
88	NA	B.COM. (PASS-COURSE)	NA	Macro Economics -I	2013
89	NA	B.COM. (PASS-COURSE)	NA	Marketing Management -II	2013
90	NA	B.COM. (PASS-COURSE)	NA	Financial Market Operations	2013
91	NA	B.COM. (PASS-COURSE)	NA	International Marketing	2013
92	NA	B.COM. (PASS-COURSE)	NA	Human Resource Management	2013
93	NA	B.COM. (PASS-COURSE)	NA	Basics of retailing/Fundamentaling of Insourence	2013
94	NA	B.COM. (PASS-COURSE)	NA	International Business Environment & International Trade	2013
95	NA	B.COM. (PASS-COURSE)	NA	Secretarial Practices	2013
96	NA	B.COM. (PASS-COURSE)	NA	Auditing	2013
97	NA	B.COM. (PASS-COURSE)	NA	Indirect Taxes	2013
98	NA	B.COM. (PASS-COURSE)	NA	Banking & Banking Law	2013
99	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-I	2015
100	NA	B.SC. (NON-MEDICAL)	NA	properties of matter kinetic theory and relativity	2015
101	NA	B.SC. (NON-MEDICAL)	NA	Electomagnetic induction and electronic devices	2015
102	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-II	2015
103	NA	B.SC. (NON-MEDICAL)	NA	Optics (I) Physics	2015
104	NA	B.SC. (NON-MEDICAL)	NA	Computer programming and thermodynamics	2015
105	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-III	2015
106	NA	B.SC. (NON-MEDICAL)	NA	Statistical Mechanics (Physics)	2015
107	NA	B.SC. (NON-MEDICAL)	NA	Optics (II) Physics	2015
108	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-IV	2015
109	NA	B.SC. (NON-MEDICAL)	NA	Quantum Mechanics (Physics)	2015

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110	NA	B.SC. (NON-MEDICAL)	NA	Solid state Physics	2015
111	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-V	2015
112	NA	B.SC. (NON-MEDICAL)	NA	Atomic Molecular And Laser Physics	2015
113	NA	B.SC. (NON-MEDICAL)	NA	Nuclear Physics	2015
114	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-VI	2015
115	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry I	2015
116	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry I	2015
117	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry I	2015
118	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical I	2015
119	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry II	2015
120	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry II	2015
121	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry II	2015
122	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical II	2015
123	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry III	2015
124	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry III	2015
125	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry III	2015
126	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical III	2015
127	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry IV	2015
128	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry IV	2015
129	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry IV	2015
130	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical IV	2015
131	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry V	2015
132	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry V	2015
133	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry V	2015
134	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical V	2015
135	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry VI	2015
136	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry VI	2015
137	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry VI	2015
138	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical VI	2015
139	NA	B.SC. (NON-MEDICAL)	NA	Algebra	2015
140	NA	B.SC. (NON-MEDICAL)	NA	Calculus	2015
141	NA	B.SC. (NON-MEDICAL)	NA	Solide Geometry	2015
142	NA	B.SC. (NON-MEDICAL)	NA	Number theory and Trigonometry	2015
143	NA	B.SC. (NON-MEDICAL)	NA	Ordinary Differential Equation	2015
144	NA	B.SC. (NON-MEDICAL)	NA	Vector Calculus	2015
145	NA	B.SC. (NON-MEDICAL)	NA	Advance Calculus	2015
146	NA	B.SC. (NON-MEDICAL)	NA	Partial Differential Equation	2015
147	NA	B.SC. (NON-MEDICAL)	NA	Statics	2015
148	NA	B.SC. (NON-MEDICAL)	NA	Special Function and Transformation	2015

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149	NA	B.SC. (NON-MEDICAL)	NA	Sequence and series	2015
150	NA	B.SC. (NON-MEDICAL)	NA	Programming in C and N.A	2015
151	NA	B.SC. (NON-MEDICAL)	NA	C(Practical)	2015
152	NA	B.SC. (NON-MEDICAL)	NA	Real analysis	2015
153	NA	B.SC. (NON-MEDICAL)	NA	Group and Rings	2015
154	NA	B.SC. (NON-MEDICAL)	NA	Num. Analysis	2015
155	NA	B.SC. (NON-MEDICAL)	NA	Num. Analysis (Practical)	2015
156	NA	B.SC. (NON-MEDICAL)	NA	Real and Complex	2015
157	NA	B.SC. (NON-MEDICAL)	NA	Linear algebra	2015
158	NA	B.SC. (NON-MEDICAL)	NA	Dynamics	2015
159	NA	B.SC. (NON-MEDICAL)	NA	Chronical of Times	2015
160	NA	B.SC. (NON-MEDICAL)	NA	Ideas Aglow	2015
161	NA	B.SC. (NON-MEDICAL)	NA	Environmental Studies I	2015
162	NA	B.SC. (NON-MEDICAL)	NA	Environmental Studies II	2015
163	NA	B.SC. (NON-MEDICAL)	NA	Hindi I / Sanskrit I	2015
164	NA	B.SC. (NON-MEDICAL)	NA	Hindi II / Sanskrit II	2015
165	NA	B.Sc. (Medical)	NA	Life and Diversity from protozoa to helminthes(Zoology)	2019
166	NA	B.Sc. (Medical)	NA	Cell Biology (Zoology)	2019
167	NA	B.Sc. (Medical)	NA	Zoology Practical-I	2019
168	NA	B.Sc. (Medical)	NA	Life and Diversity from Annelida to Hemichordates(Zoology)	2019
169	NA	B.Sc. (Medical)	NA	Genetics (Zoology)	2019
170	NA	B.Sc. (Medical)	NA	Zoology Practical-II	2019
171	NA	B.Sc. (Medical)	NA	Life and Diversity of chordates-I (Zoology)	2019
172	NA	B.Sc. (Medical)	NA	Mammalian Physiology-I (Zoology)	2019
173	NA	B.Sc. (Medical)	NA	Zoology Practical-III	2019
174	NA	B.Sc. (Medical)	NA	Life and Diversity of chordates-II (Zoology)	2019
175	NA	B.Sc. (Medical)	NA	Mammalian Physiology-II (Zoology)	2019
176	NA	B.Sc. (Medical)	NA	Zoology Practical-IV	2019
177	NA	B.Sc. (Medical)	NA	Fish and Fisheries (Zoology)	2019
178	NA	B.Sc. (Medical)	NA	Ecology and Evolution (Zoology)	2019
179	NA	B.Sc. (Medical)	NA	Zoology Practical-V	2019
180	NA	B.Sc. (Medical)	NA	Entomology (Zoology)	2019
181	NA	B.Sc. (Medical)	NA	Developmental Biology) (Zoology)	2019
182	NA	B.Sc. (Medical)	NA	Zoology Practical-VI	2019
183	NA	B.Sc. (Medical)	NA	Diversity of microbes (Botany)	2019
184	NA	B.Sc. (Medical)	NA	Cell Biology (Botany)	2019
185	NA	B.Sc. (Medical)	NA	Botany Practical (101)	2019
186	NA	B.Sc. (Medical)	NA	Diversity of Archegoniates (Botany)	2019

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187	NA	B.Sc. (Medical)	NA	Genetics (Botany)	2019
188	NA	B.Sc. (Medical)	NA	Botany Practical (102)	2019
189	NA	B.Sc. (Medical)	NA	Biology and Diversity of Seed Plants - I (Botany)	2019
190	NA	B.Sc. (Medical)	NA	Plant Anatomy (Botany)	2019
191	NA	B.Sc. (Medical)	NA	Botany practical (201)	2019
192	NA	B.Sc. (Medical)	NA	Biology and Diversity of Seed Plants - II (Botany)	2019
193	NA	B.Sc. (Medical)	NA	Plant Embryology (Botany)	2019
194	NA	B.Sc. (Medical)	NA	Botany Practical (202)	2019
195	NA	B.Sc. (Medical)	NA	Plant Physiology (Botany)	2019
196	NA	B.Sc. (Medical)	NA	Ecology (Botany)	2019
197	NA	B.Sc. (Medical)	NA	Botany Practical (301)	2019
198	NA	B.Sc. (Medical)	NA	Biochemistry and Plant Biotechnology (Botany)	2019
199	NA	B.Sc. (Medical)	NA	Economic Botany	2019
200	NA	B.Sc. (Medical)	NA	Botany practical (302)	2019
201	NA	B.Sc. (Medical)	NA	Chronical of Times	2019
202	NA	B.Sc. (Medical)	NA	Ideas Aglow	2019

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List of courses offered across all programs during the session (2020-21)

	1.1 List of courses offered across all programs during the session (2020-21)				
Sr. No.	Program code	Program Name	Course code	Course Name	Year of introduction
1	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-I	2013
2	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-II	2013
3	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-III	2013
4	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-IV	2013
5	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-V	2013
6	NA	B.A. (PASS-COURSE)	NA	HINDI (COMPULSORY) THEORY-VI	2013
7	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-I	2013
8	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-II	2013
9	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-III	2013
10	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-IV	2013
11	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-V	2013
12	NA	B.A. (PASS-COURSE)	NA	ENGLISH (COMPULSORY) THEORY-VI	2013
13	NA	B.A. (PASS-COURSE)	NA	HISTORY OF INDIA (EARLY AGE TO 1200 A.D.)	2013
14	NA	B.A. (PASS-COURSE)	NA	HISTORY OF INDIA (1200 TO 1707 A.D.	2013
15	NA	B.A. (PASS-COURSE)	NA	HISTORY OF MODERN INDIA 1707-1950 A.D.	2013
16	NA	B.A. (PASS-COURSE)	NA	HISTORY OF HARYANA	2013
17	NA	B.A. (PASS-COURSE)	NA	HISTORY OF ANCIENT & MEDIVAL WORLD	2013
18	NA	B.A. (PASS-COURSE)	NA	HISTORY OF MODERN WORLD	2013
19	NA	B.A. (PASS-COURSE)	NA	Geography of India (TH.)	2013
20	NA	B.A. (PASS-COURSE)	NA	Maps and Scales (Pr.)	2013
21	NA	B.A. (PASS-COURSE)	NA	Physical Geography-I (Th.)	2013
22	NA	B.A. (PASS-COURSE)	NA	Representation of physical Features (Pr.)	2013
23	NA	B.A. (PASS-COURSE)	NA	Physical Geography-II (Th.)	2013
24	NA	B.A. (PASS-COURSE)	NA	Representation of Climatic Data(Pr.)	2013
25	NA	B.A. (PASS-COURSE)	NA	Human Geography (Th.)	2013
26	NA	B.A. (PASS-COURSE)	NA	Maps Projections (Pr.)	2013
27	NA	B.A. (PASS-COURSE)	NA	Economic Geography(Th.)	2013
28	NA	B.A. (PASS-COURSE)	NA	Distribution maps and diagrams (Pr.)	2013
29	NA	B.A. (PASS-COURSE)	NA	Introduction to remote Sensing,GIS,Quantitive methods	2013
30	NA	B.A. (PASS-COURSE)	NA	Introduction to R S & Field survey Report (Pr.)	2013
31	NA	B.A. (PASS-COURSE)	NA	Indian Constitution	2013
32	NA	B.A. (PASS-COURSE)	NA	Principles of Political Science III	2013
33	NA	B.A. (PASS-COURSE)	NA	Principles of Political Science IV	2013
34	NA	B.A. (PASS-COURSE)	NA	International organisation V	2013

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35	NA	B.A. (PASS-COURSE)	NA	International organisation VI	2013
36	NA	B.A. (PASS-COURSE)	NA	Micro Economics -I	2013
37	NA	B.A. (PASS-COURSE)	NA	Micro Economics -II	2013
38	NA	B.A. (PASS-COURSE)	NA	Macro Economics -I	2013
39	NA	B.A. (PASS-COURSE)	NA	Macro Economics -II	2013
40	NA	B.A. (PASS-COURSE)	NA	Development Economics	2013
41	NA	B.A. (PASS-COURSE)	NA	International Economics	2013
42	NA	B.A. (PASS-COURSE)	NA	Algebra	2013
43	NA	B.A. (PASS-COURSE)	NA	Calculus	2013
44	NA	B.A. (PASS-COURSE)	NA	Solid Geometry	2013
45	NA	B.A. (PASS-COURSE)	NA	Ordinary Differential Equation	2013
46	NA	B.A. (PASS-COURSE)	NA	Vector Calculus	2013
47	NA	B.A. (PASS-COURSE)	NA	Number Theory & Trigonometry	2013
48	NA	B.A. (PASS-COURSE)	NA	Statistics	2013
49	NA	B.A. (PASS-COURSE)	NA	Advance calculus	2013
50	NA	B.A. (PASS-COURSE)	NA	Partial Differential Equation	2013
51	NA	B.A. (PASS-COURSE)	NA	Sequence And Series	2013
52	NA	B.A. (PASS-COURSE)	NA	Programming in C & Numerical Analysis	2013
53	NA	B.A. (PASS-COURSE)	NA	Special Function & Transforms	2013
54	NA	B.A. (PASS-COURSE)	NA	Group and Rings	2013
55	NA	B.A. (PASS-COURSE)	NA	Numerical Analysis	2013
56	NA	B.A. (PASS-COURSE)	NA	Real Analysis	2013
57	NA	B.A. (PASS-COURSE)	NA	Real And Complex	2013
58	NA	B.A. (PASS-COURSE)	NA	Linear Algebra	2013
59	NA	B.A. (PASS-COURSE)	NA	Dynamics	2013
60	NA	B.A. (PASS-COURSE)	NA	C Practrical	2013
61	NA	B.A. (PASS-COURSE)	NA	Numerical Practical	2013
62	NA	B.COM. (PASS-COURSE)	NA	Financial Accounting -I	2013
63	NA	B.COM. (PASS-COURSE)	NA	Financial Accounting -II	2013
64	NA	B.COM. (PASS-COURSE)	NA	Corporate accounting -I	2013
65	NA	B.COM. (PASS-COURSE)	NA	Corporate accounting -II	2013
66	NA	B.COM. (PASS-COURSE)	NA	Taxation Law -I	2013
67	NA	B.COM. (PASS-COURSE)	NA	Cost Accounting -I	2013
68	NA	B.COM. (PASS-COURSE)	NA	Accounting for management	2013
69	NA	B.COM. (PASS-COURSE)	NA	Taxation Law -II	2013
70	NA	B.COM. (PASS-COURSE)	NA	Cost Accounting -II	2013
71	NA	B.COM. (PASS-COURSE)	NA	Financial Management	2013
72	NA	B.COM. (PASS-COURSE)	NA	Business Mathematics -I	2013
73	NA	B.COM. (PASS-COURSE)	NA	Business Mathematics -II	2013

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Phone: 01285-231122(O)

E-mail: gcsatnali@yahoo.com

74	NA	B.COM. (PASS-COURSE)	NA	Business Statistics -I	2013
75	NA	B.COM. (PASS-COURSE)	NA	Business Statistics -II	2013
76	NA	B.COM. (PASS-COURSE)	NA	Business Economics -I	2013
77	NA	B.COM. (PASS-COURSE)	NA	Business Economics -II	2013
78	NA	B.COM. (PASS-COURSE)	NA	Business Management -I	2013
79	NA	B.COM. (PASS-COURSE)	NA	Business Management -II	2013
80	NA	B.COM. (PASS-COURSE)	NA	Business Communication Skills	2013
81	NA	B.COM. (PASS-COURSE)	NA	Business environment -II	2013
82	NA	B.COM. (PASS-COURSE)	NA	Basics of Computer -I	2013
83	NA	B.COM. (PASS-COURSE)	NA	Basics of computer -II	2013
84	NA	B.COM. (PASS-COURSE)	NA	Business Regulatory & Framework-I	2013
85	NA	B.COM. (PASS-COURSE)	NA	Business Regulatory & Framework-II	2013
86	NA	B.COM. (PASS-COURSE)	NA	Corporate law -I	2013
87	NA	B.COM. (PASS-COURSE)	NA	Corporate law -II	2013
88	NA	B.COM. (PASS-COURSE)	NA	Macro Economics -I	2013
89	NA	B.COM. (PASS-COURSE)	NA	Marketing Management -II	2013
90	NA	B.COM. (PASS-COURSE)	NA	Financial Market Operations	2013
91	NA	B.COM. (PASS-COURSE)	NA	International Marketing	2013
92	NA	B.COM. (PASS-COURSE)	NA	Human Resource Management	2013
93	NA	B.COM. (PASS-COURSE)	NA	Basics of retailing/Fundamentaling of Insourence	2013
94	NA	B.COM. (PASS-COURSE)	NA	International Business Environment & International Trade	2013
95	NA	B.COM. (PASS-COURSE)	NA	Secretarial Practices	2013
96	NA	B.COM. (PASS-COURSE)	NA	Auditing	2013
97	NA	B.COM. (PASS-COURSE)	NA	Indirect Taxes	2013
98	NA	B.COM. (PASS-COURSE)	NA	Banking & Banking Law	2013
99	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-I	2015
100	NA	B.SC. (NON-MEDICAL)	NA	properties of matter kinetic theory and relativity	2015
101	NA	B.SC. (NON-MEDICAL)	NA	Electomagnetic induction and electronic devices	2015
102	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-II	2015
103	NA	B.SC. (NON-MEDICAL)	NA	Optics (I) Physics	2015
104	NA	B.SC. (NON-MEDICAL)	NA	Computer programming and thermodynamics	2015
105	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-III	2015
106	NA	B.SC. (NON-MEDICAL)	NA	Statistical Mechanics (Physics)	2015
107	NA	B.SC. (NON-MEDICAL)	NA	Optics (II) Physics	2015
108	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-IV	2015
109	NA	B.SC. (NON-MEDICAL)	NA	Quantum Mechanics (Physics)	2015

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110	NA	B.SC. (NON-MEDICAL)	NA	Solid state Physics	2015
111	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-V	2015
112	NA	B.SC. (NON-MEDICAL)	NA	Atomic Molecular And Laser Physics	2015
113	NA	B.SC. (NON-MEDICAL)	NA	Nuclear Physics	2015
114	NA	B.SC. (NON-MEDICAL)	NA	Physics practical-VI	2015
115	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry I	2015
116	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry I	2015
117	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry I	2015
118	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical I	2015
119	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry II	2015
120	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry II	2015
121	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry II	2015
122	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical II	2015
123	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry III	2015
124	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry III	2015
125	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry III	2015
126	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical III	2015
127	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry IV	2015
128	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry IV	2015
129	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry IV	2015
130	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical IV	2015
131	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry V	2015
132	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry V	2015
133	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry V	2015
134	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical V	2015
135	NA	B.SC. (NON-MEDICAL)	NA	Inorganic Chemistry VI	2015
136	NA	B.SC. (NON-MEDICAL)	NA	Organic Chemistry VI	2015
137	NA	B.SC. (NON-MEDICAL)	NA	Physical Chemistry VI	2015
138	NA	B.SC. (NON-MEDICAL)	NA	Chemistry Practical VI	2015
139	NA	B.SC. (NON-MEDICAL)	NA	Algebra	2015
140	NA	B.SC. (NON-MEDICAL)	NA	Calculus	2015
141	NA	B.SC. (NON-MEDICAL)	NA	Solide Geometry	2015
142	NA	B.SC. (NON-MEDICAL)	NA	Number theory and Trigonometry	2015
143	NA	B.SC. (NON-MEDICAL)	NA	Ordinary Differential Equation	2015
144	NA	B.SC. (NON-MEDICAL)	NA	Vector Calculus	2015
145	NA	B.SC. (NON-MEDICAL)	NA	Advance Calculus	2015
146	NA	B.SC. (NON-MEDICAL)	NA	Partial Differential Equation	2015
147	NA	B.SC. (NON-MEDICAL)	NA	Statics	2015
148	NA	B.SC. (NON-MEDICAL)	NA	Special Function and Transformation	2015

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149	NA	B.SC. (NON-MEDICAL)	NA	Sequence and series	2015
150	NA	B.SC. (NON-MEDICAL)	NA	Programming in C and N.A	2015
151	NA	B.SC. (NON-MEDICAL)	NA	C(Practical)	2015
152	NA	B.SC. (NON-MEDICAL)	NA	Real analysis	2015
153	NA	B.SC. (NON-MEDICAL)	NA	Group and Rings	2015
154	NA	B.SC. (NON-MEDICAL)	NA	Num. Analysis	2015
155	NA	B.SC. (NON-MEDICAL)	NA	Num. Analysis (Practical)	2015
156	NA	B.SC. (NON-MEDICAL)	NA	Real and Complex	2015
157	NA	B.SC. (NON-MEDICAL)	NA	Linear algebra	2015
158	NA	B.SC. (NON-MEDICAL)	NA	Dynamics	2015
159	NA	B.SC. (NON-MEDICAL)	NA	Chronical of Times	2015
160	NA	B.SC. (NON-MEDICAL)	NA	Ideas Aglow	2015
161	NA	B.SC. (NON-MEDICAL)	NA	Environmental Studies I	2015
162	NA	B.SC. (NON-MEDICAL)	NA	Environmental Studies II	2015
163	NA	B.SC. (NON-MEDICAL)	NA	Hindi I / Sanskrit I	2015
164	NA	B.SC. (NON-MEDICAL)	NA	Hindi II / Sanskrit II	2015
165	NA	B.Sc. (Medical)	NA	Life and Diversity from protozoa to helminthes(Zoology)	2019
166	NA	B.Sc. (Medical)	NA	Cell Biology (Zoology)	2019
167	NA	B.Sc. (Medical)	NA	Zoology Practical-I	2019
168	NA	B.Sc. (Medical)	NA	Life and Diversity from Annelida to Hemichordates(Zoology)	2019
169	NA	B.Sc. (Medical)	NA	Genetics (Zoology)	2019
170	NA	B.Sc. (Medical)	NA	Zoology Practical-II	2019
171	NA	B.Sc. (Medical)	NA	Life and Diversity of chordates-I (Zoology)	2019
172	NA	B.Sc. (Medical)	NA	Mammalian Physiology-I (Zoology)	2019
173	NA	B.Sc. (Medical)	NA	Zoology Practical-III	2019
174	NA	B.Sc. (Medical)	NA	Life and Diversity of chordates-II (Zoology)	2019
175	NA	B.Sc. (Medical)	NA	Mammalian Physiology-II (Zoology)	2019
176	NA	B.Sc. (Medical)	NA	Zoology Practical-IV	2019
177	NA	B.Sc. (Medical)	NA	Fish and Fisheries (Zoology)	2019
178	NA	B.Sc. (Medical)	NA	Ecology and Evolution (Zoology)	2019
179	NA	B.Sc. (Medical)	NA	Zoology Practical-V	2019
180	NA	B.Sc. (Medical)	NA	Entomology (Zoology)	2019
181	NA	B.Sc. (Medical)	NA	Developmental Biology) (Zoology)	2019
182	NA	B.Sc. (Medical)	NA	Zoology Practical-VI	2019
183	NA	B.Sc. (Medical)	NA	Diversity of microbes (Botany)	2019
184	NA	B.Sc. (Medical)	NA	Cell Biology (Botany)	2019
185	NA	B.Sc. (Medical)	NA	Botany Practical (101)	2019
186	NA	B.Sc. (Medical)	NA	Diversity of Archegoniates (Botany)	2019

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187	NA	B.Sc. (Medical)	NA	Genetics (Botany)	2019
188	NA	B.Sc. (Medical)	NA	Botany Practical (102)	2019
189	NA	B.Sc. (Medical)	NA	Biology and Diversity of Seed Plants - I (Botany)	2019
190	NA	B.Sc. (Medical)	NA	Plant Anatomy (Botany)	2019
191	NA	B.Sc. (Medical)	NA	Botany practical (201)	2019
192	NA	B.Sc. (Medical)	NA	Biology and Diversity of Seed Plants - II (Botany)	2019
193	NA	B.Sc. (Medical)	NA	Plant Embryology (Botany)	2019
194	NA	B.Sc. (Medical)	NA	Botany Practical (202)	2019
195	NA	B.Sc. (Medical)	NA	Plant Physiology (Botany)	2019
196	NA	B.Sc. (Medical)	NA	Ecology (Botany)	2019
197	NA	B.Sc. (Medical)	NA	Botany Practical (301)	2019
198	NA	B.Sc. (Medical)	NA	Biochemistry and Plant Biotechnology (Botany)	2019
199	NA	B.Sc. (Medical)	NA	Economic Botany	2019
200	NA	B.Sc. (Medical)	NA	Botany practical (302)	2019
201	NA	B.Sc. (Medical)	NA	Chronical of Times	2019
202	NA	B.Sc. (Medical)	NA	Ideas Aglow	2019

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Scheme & Examination of Compulsory Hindi (B.A. I--VI Sem.)

B.A. I Sem

Paper No.	Name of Paper	Max. Marks	Written	Internal
Paper I	हिंदी अनिवार्य	100	80	20

B.A. II Sem

Paper No.	Name of Paper	Max. Marks	Written	Internal
Paper II	हिंदी अनिवार्य	100	80	20

B.A. III Sem

Paper No.	Name of Paper	Max. Marks	Written	Internal
Paper III	हिंदी अनिवार्य	100	80	20

B.A. IV Sem

Paper No.	Name of Paper	Max. Marks	Written	Internal
Paper IV	हिंदी अनिवार्य	100	80	20

B.A. V Sem

Paper No.	Name of Paper	Max. Marks	Written	Internal
Paper V	हिंदी अनिवार्य	100	80	20

B.A. VI Sem

Paper No.	Name of Paper	Max. Marks	Written	Internal
Paper VI	हिंदी अनिवार्य	100	80	20

Head
Dept. of Hindi

अध्यक्ष,
हिन्दी–विभाग
इन्दिरा गांधी विश्वविद्यालय
मीरपुर (रेवाड़ी)

संयुक्त पाठ्यक्रम
(इन्दिरा गाँधी विश्वविद्यालय, महर्षि दयानन्द विश्वविद्यालय और कुरुक्षेत्र विश्वविद्यालय के लिए)
जुलाई 2013
बी0ए0 : प्रथम सेमेस्टर
हिन्दी (अनिवार्य)

समय : 3 घण्टे

कुल अंक : 100
लिखित परीक्षा : 80 अंक
आंतरिक मूल्यांकन : 20 अंक

निर्धारित पाठ्यक्रम

- निर्धारित पाठ्यपुस्तक मध्यकालीन काव्य-कुंज : सं0 डॉ0 रामसजन पाण्डेय
  प्रकाशक : खाटू श्याम प्रकाशन, 1276/5, पीर जी मोहल्ला, प्रताप टाकीज़, रोहतक।
  मोबाइल न0 09991708080
- हिंदी साहित्य का आदिकाल
- काव्यशास्त्र
- वस्तुनिष्ठ प्रश्न

खण्ड—क : मध्यकालीन काव्य–कुंज

निर्धारित आलोचनात्मक प्रश्न

पाठ्यक्रम में निर्धारित कवियों पर उनके साहित्यिक परिचय, अनुभूतिगत वैशिष्ट्य तथा अभिव्यक्तिगत सौष्ठव पर ही प्रश्न पूछे जायेंगे । कवियों की विशिष्ट रचनात्मक प्रवृत्ति पर प्रश्न नहीं पूछे जायेंगे ।

खण्ड—ख : हिन्दी साहित्य का आदिकाल
पाठ्यक्रम में निर्धारित आलोचनात्मक प्रश्न
1   हिन्दी साहित्येतिहास लेखन की परम्परा
2   आदिकाल का नामकरण
3   आदिकाल की परिस्थितियाँ
4   आदिकालीन साहित्य की सामान्य प्रवृत्तियाँ
5   रासोकाव्य परम्परा : संक्षिप्त परिचय

खण्ड—ग : काव्यशास्त्र पर आधारित विषय

1   काव्य के तत्व
2   रस : स्वरूप और अंग
3   रस के भेद

4   अलंकार–अनुप्रास, श्लेष, यमक, उपमा, रूपक, उत्प्रेक्षा, अतिशयोक्ति,
     मानवीकरण, अन्योक्ति, समासोक्ति
    छंद–दोहा, चौपाई, सोरठा, बरवै, कुण्डलियाँ, छप्पय, कवित्त, घनाक्षरी
    शब्दशक्तियाँ : अभिधा, लक्षणा, व्यंजना
    काव्य-गुण : प्रसाद, माधुर्य और ओज

खण्ड—घ : वस्तुनिष्ठ प्रश्न

निर्देश—

1 खण्ड (क) में निर्धारित पाठ्य–पुस्तक में से व्याख्या के लिए चार अवतरण पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो की सप्रसंग व्याख्या करनी होगी । प्रत्येक व्याख्या 6 अंक की होगी। पूरा प्रश्न 12 अंक का होगा ।

2 खण्ड (क) में निर्धारित आलोचनात्मक प्रश्नों में से दो प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को एक प्रश्न का उत्तर देना होगा । यह प्रश्न 8 अंक का होगा ।

3 खण्ड (क) में निर्धारित पाठ्य पुस्तक एवं आलोचनात्मक प्रश्नों में से छ: लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं चार प्रश्नों का उत्तर देना होगा। प्रत्येक प्रश्न के लिए चार अंक निर्धारित हैं । पूरा प्रश्न 16 अंक का होगा ।

4 खण्ड (ख) में निर्धारित आलोचनात्मक प्रश्नों में से चार प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को दो प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न 8–8 अंक का होगा । इस प्रकार यह प्रश्न 16 अंक का होगा ।

5 खण्ड (ख) में निर्धारित प्रश्नों में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं दो प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न के लिए पाँच अंक निर्धारित हैं। पूरा प्रश्न 10 अंक का होगा ।

6 खण्ड (ग) में निर्धारित पाठ्यक्रम में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो प्रश्नों का उत्तर देना होगा । प्रत्येक उप प्रश्न 5 अंक का तथा पूरा प्रश्न 10 अंक का होगा ।

7 खण्ड (घ) में पूरे पाठ्यक्रम में से 8 वस्तुनिष्ठ प्रश्न पूछे जाएंगे । प्रत्येक प्रश्न 1 अंक का तथा पूरा प्रश्न 8 अंक का होगा ।

समय : 3 घण्टे

कुल अंक :   100
लिखित परीक्षा :   80 अंक
आंतरिक मूल्यांकन : 20 अंक

निर्धारित पाठ्यक्रम

- ध्रुवस्वामिनी (नाटक) : जयशंकर प्रसाद
- हिन्दी साहित्य का भक्तिकाल
- व्यावहारिक हिन्दी
- वस्तुनिष्ठ प्रश्न

खण्ड—क : ध्रुवस्वामिनी
पाठ्यक्रम में निर्धारित आलोचनात्मक प्रश्न

1   'ध्रुवस्वामिनी' नाटक का प्रतिपाद्य
2   'ध्रुवस्वामिनी' नाटक की पात्र—योजना
3   'ध्रुवस्वामिनी' नाटक की अभिनेयता
4   प्रसाद की नाट्यकला

खण्ड—ख : हिन्दी साहित्य का भक्तिकाल
पाठ्यक्रम में निर्धारित आलोचनात्मक प्रश्न

1   भक्तिकाल की परिस्थितियाँ
2   संत काव्य की प्रवृत्तियाँ
3   सूफी काव्य की प्रवृत्तियाँ
4   राम काव्य की प्रवृत्तियाँ
5   कृष्ण काव्य की प्रवृत्तियाँ
6   भक्तिकाल : स्वर्णयुग

खण्ड—ग : व्यावहारिक हिंदी
पाठ्यक्रम में निर्धारित विषय

1   भाषा की परिभाषा
2   भाषा के विविध रूप : वोली, मानक भाषा, राजभाषा, राष्ट्रभाषा, माध्यमभाषा, मातृभाषा
3   मानक—भाषा की प्रमुख प्रवृत्तियाँ
4   हिन्दी वर्णमाला : स्वर एवं व्यंजन
5   हिन्दी वर्तनी : समस्या और समाधान
6   मुहावरे एवं लोकोक्तियाँ

खण्ड—घ   : वस्तुनिष्ठ प्रश्न

निर्देश—

1. खण्ड (क) में निर्धारित पाठ्य–पुस्तक में से व्याख्या के लिए चार अवतरण पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो की सप्रसंग व्याख्या करनी होगी । प्रत्येक व्याख्या 6 अंक की होगी । पूरा प्रश्न 12 अंक का होगा ।

2. खण्ड (क) में निर्धारित आलोचनात्मक प्रश्नों में से दो प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को एक प्रश्न का उत्तर देना होगा । यह प्रश्न 8 अंक का होगा ।

3. खण्ड (क) में निर्धारित पाठ्य पुस्तक एवं आलोचनात्मक प्रश्नों में से छः लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं चार प्रश्नों का उत्तर देना होगा। प्रत्येक प्रश्न के लिए चार अंक निर्धारित हैं । पूरा प्रश्न 16 अंक का होगा ।

4. खण्ड (ख) में निर्धारित आलोचनात्मक प्रश्नों में से चार प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को दो प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न 8–8 अंक का होगा । इस प्रकार यह प्रश्न 16 अंक का होगा ।

5. खण्ड (ख) में निर्धारित प्रश्नों में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं दो प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न के लिए पाँच अंक निर्धारित हैं । पूरा प्रश्न 10 अंक का होगा ।

6. खण्ड (ग) में निर्धारित पाठ्यक्रम में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो प्रश्नों का उत्तर देना होगा । प्रत्येक उप प्रश्न के लिए 5 अंक निर्धारित हैं। पूरा प्रश्न 10 अंक का होगा ।

7. खण्ड (घ) में पूरे पाठ्यक्रम में से 8 वस्तुनिष्ठ प्रश्न पूछे जाएंगे । प्रत्येक प्रश्न 1 अंक का तथा पूरा प्रश्न 8 अंक का होगा।

समय : 3 घण्टे

कुल अंक : 100
लिखित परीक्षा : 80 अंक
आंतरिक मूल्यांकन : 20 अंक

निर्धारित पाठ्यक्रम

- आधुनिक हिंदी कविता,
  प्रधान सं० डॉ० सरिता वशिष्ठ, कुरुक्षेत्र विश्वविद्यालय प्रकाशन, कुरुक्षेत्र
- हिंदी साहित्य का रीतिकाल
- प्रयोजनमूलक हिंदी : हिंदी कंप्यूटिंग और अनुवाद
- वस्तुनिष्ठ प्रश्न

खण्ड——क :. आधुनिक हिंदी कविता

निर्धारित आलोचनात्मक प्रश्न

पाठ्यक्रम में निर्धारित कवियों के साहित्यिक परिचय, अनुभूतिगत वैशिष्ट्य तथा अभिव्यक्तिगत सौष्ठव पर ही प्रश्न पूछे जाएंगे । कवियों की विशिष्ट रचनात्मक प्रवृत्ति पर प्रश्न नहीं पूछे जाएंगे ।

खण्ड——ख : हिंदी साहित्य का रीतिकाल
पाठ्यक्रम में निर्धारित आलोचनात्मक प्रश्न
1 रीतिकालीन हिंदी कविता की पृष्ठभूमि
2 रीतिकाल का नामकरण
3 रीतिबद्ध काव्य की विशेषताएँ
4 रीतिमुक्त काव्य की विशेषताएँ
5 रीतिकालीन काव्य की उपलब्धियाँ

खण्ड——ग : प्रयोजनमूलक हिंदी : हिंदी कंप्यूटिंग और अनुवाद
पाठ्यक्रम में निर्धारित विषय
1 कंप्यूटर : स्वरूप और महत्व
2 ई—मेल : प्रेषण—ग्रहण
3 इंटरनेट : स्वरूप और उपयोगिता
4 मशीनी अनुवाद
5 अनुवाद : परिभाषा और स्वरूप

खण्ड——घ : वस्तुनिष्ठ प्रश्न

निर्देश—

1 खण्ड (क) में निर्धारित पाठ्य—पुस्तक में से व्याख्या के लिए चार अवतरण पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो की सप्रसंग व्याख्या करनी होगी । प्रत्येक व्याख्या 6 अंक की होगी ।

पूरा प्रश्न 12 अंक का होगा ।

2 खण्ड (क) में निर्धारित आलोचनात्मक प्रश्नों में से दो प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थिय
को एक प्रश्न का उत्तर देना होगा । यह प्रश्न 8 अंक का होगा ।

3 खण्ड (क) में निर्धारित पाठ्य पुस्तक एवं आलोचनात्मक प्रश्नों में से छः लघूत्तरी प्रश्न पूछे
जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं चार प्रश्नों का उत्तर देना होग
प्रत्येक प्रश्न के लिए चार अंक निर्धारित हैं । पूरा प्रश्न 16 अंक का होगा ।

4 खण्ड (ख) में निर्धारित आलोचनात्मक प्रश्नों में से चार प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों
को दो प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न 8–8 अंक का होगा । इस प्रकार यह प्रश्न
16 अंक का होगा ।

5 खण्ड (ख) में निर्धारित प्रश्नों में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को
लगभग 150 शब्दों में किन्हीं दो प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न के लिए पाँच अंक
निर्धारित हैं । पूरा प्रश्न 10 अंक का होगा ।

6 खण्ड (ग) में निर्धारित पाठ्यक्रम में से चार लघुत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को
किन्हीं दो प्रश्नों का उत्तर देना होगा । प्रत्येक उप प्रश्न के लिए 5 अंक निर्धारित हैं। पूरा प्रश्न
10 अंक का होगा ।

7 खण्ड (घ) में पूरे पाठ्यक्रम में से 8 वस्तुनिष्ठ प्रश्न पूछे जाएंगे । प्रत्येक प्रश्न 1 अंक का तथा
पूरा प्रश्न 8 अंक का होगा।

समय : 3 घण्टे

कुल अंक : 100
लिखित परीक्षा : 80 अंक
आंतरिक मूल्यांकन : 20 अंक

निर्धारित पाठ्यक्रम

* कथा कम सं0 डॉ0 रोहिणी अग्रवाल,
  प्रकाशक : खाटू श्याम प्रकाशन, 1276 / 5, पीर जी मोहल्ला, प्रताप टाकीज़, रोहतक।
  मोबाइल न0 09991708080
* हिंदी साहित्य का आधुनिक काल : गद्य
* पारिभाषिक शब्दावली
* वस्तुनिष्ठ प्रश्न

खण्ड——क : कथाकम

निर्धारित आलोचनात्मक प्रश्न

पाठ्यक्रम में निर्धारित कहानीकारों के साहित्यिक परिचय, निर्धारित कहानियों के वस्तु पक्ष तथा कला पक्ष पर ही प्रश्न पूछे जाएंगे ।

खण्ड——ख : हिंदी साहित्य का आधुनिक काल : गद्य

पाठ्यक्रम में निर्धारित आलोचनात्मक प्रश्न
1 आधुनिक काल की परिस्थितियाँ
2 हिंदी उपन्यास : उद्भव और विकास
3 हिंदी कहानी : उद्भव और विकास
4 हिंदी नाटक : उद्भव और विकास
5 हिंदी निबन्ध : उद्भव और विकास

खण्ड——ग : पारिभाषिक शब्दावली

निर्धारित विषय

1 पारिभाषिक शब्दावली : स्वरूप और महत्व
2 पारिभाषिक शब्दावली के गुण
3 पारिभाषिक शब्दावली के निर्माण में सक्रिय विविध सम्प्रदाय : राष्ट्रीयतावादी, अन्तरराष्ट्रीयतावादी, समन्वयवादी ।

खण्ड—— घ : वस्तुनिष्ठ प्रश्न

निर्देश

1 खण्ड (क) में निर्धारित पाठ्य–पुस्तक में से व्याख्या के लिए चार अवतरण पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो की सप्रसंग व्याख्या करनी होगी । प्रत्येक व्याख्या 6 अंक की होगी ।

पूरा प्रश्न 12 अंक का होगा ।

2 खण्ड (क) में निर्धारित आलोचनात्मक प्रश्नों में से दो प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को एक प्रश्न का उत्तर देना होगा । यह प्रश्न 8 अंक का होगा ।

3 खण्ड (क) में निर्धारित पाठ्य पुस्तक एवं आलोचनात्मक प्रश्नों में से छ: लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं चार प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न के लिए चार अंक निर्धारित हैं । पूरा प्रश्न 16 अंक का होगा ।

4 खण्ड (ख) में निर्धारित आलोचनात्मक प्रश्नों में से चार प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को दो प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न 8–8 अंक का होगा । इस प्रकार यह प्रश्न 16 अंक का होगा ।

5 खण्ड (ख) में निर्धारित प्रश्नों में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं दो प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न के लिए पाँच अंक निर्धारित हैं । पूरा प्रश्न 10 अंक का होगा ।

6 खण्ड (ग) में निर्धारित पाठ्यक्रम में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो प्रश्नों का उत्तर देना होगा । प्रत्येक उप प्रश्न के लिए 5 अंक निर्धारित हैं। पूरा प्रश्न 10 अंक का होगा ।

7 खण्ड (घ) में पूरे पाठ्यक्रम में से 8 वस्तुनिष्ठ प्रश्न पूछे जाएंगे । प्रत्येक प्रश्न 1 अंक का तथा पूरा प्रश्न 8 अंक का होगा।

संयुक्त पाठ्यक्रम
(इन्दिरा गाँधी विश्वविद्यालय, महर्षि दयानन्द विश्वविद्यालय और कुरुक्षेत्र विश्वविद्यालय के लिए)
बी०ए० : पाँचवाँ सेमेस्टर
जुलाई 2013
हिन्दी (अनिवार्य)

समय : 3 घण्टे

कुल अंक : 100
लिखित परीक्षा : 80 अंक
आंतरिक मूल्यांकन : 20 अंक

निर्धारित पाठ्यक्रम

- समकालीन हिंदी कविता, ;कुरुक्षेत्र विश्वविद्यालय, कुरुक्षेत्र सम्पादितद्ध
- हिंदी साहित्य का आधुनिक काल : कविता
- प्रयोजनमूलक हिंदी : पत्र लेखन, संक्षेपण तथा पल्लवन
- वस्तुनिष्ठ प्रश्न

खण्ड—क : प्रस्तावित निर्धारित पाठ्यपुस्तक

पंचम सेमेस्टर हिंदी (अनिवार्य) की समकालीन हिंदी कविता पर आधारित पाठ्यपुस्तक (जिसका नामकरण पुस्तक—निर्माण के साथ किया जाएगा) कुरुक्षेत्र विश्वविद्यालय, कुरुक्षेत्र का हिंदी—विभाग तैयार करेगा। कुरुक्षेत्र विश्वविद्यालय के हिंदी—विभाग का दायित्व होगा कि पाठ्यक्रम प्रभावी होने से पहले वह पाठ्यपुस्तक विद्यार्थियों को उपलब्ध कराए ।

प्रस्तुत प्रस्तावित पाठ्य पुस्तक में निम्नलिखित रचनाकारों की रचनाओं को शामिल किया जाएगा—

1   स0 ही0 वात्स्यायन अज्ञेय
2   धर्मवीर भारती
3   श्रीनरेश मेहता
4   नागार्जुन
5   रघुवीर सहाय
6   कुँवर नारायण
7   लीलाधर जगूड़ी

निर्धारित आलोचनात्मक प्रश्न

पाठ्यक्रम में निर्धारित कवियों के साहित्यिक परिचय, अनुभूतिगत वैशिष्ट्य तथा अभिव्यक्तिगत सौष्ठव पर ही प्रश्न पूछे जायेंगे । कवियों की विशिष्ट रचनात्मक प्रवृत्ति पर प्रश्न नहीं पूछे जायेंगे ।

खण्ड—ख : हिंदी साहित्य का आधुनिक काल : कविता
पाठ्यक्रम में निर्धारित आलोचनात्मक प्रश्न

1   भारतेन्दुयुगीन हिंदी कविता की प्रवृत्तियाँ
2   द्विवेदीयुगीन हिंदी कविता की प्रवृत्तियाँ
3   छायावाद
4   प्रगतिवाद
5   प्रयोगवाद
6   नयी कविता
7   समकालीन कविता

खण्ड—ग : प्रयोजनमूलक हिंदी : पत्र लेखन, संक्षेपण तथा पल्लवन

1 पत्र लेखन : स्वरूप और उसके विविध भेद
2 संक्षेपण
3 पल्लवन

खण्ड—घ : वस्तुनिष्ठ प्रश्न

निर्देश

1 खण्ड (क) में निर्धारित पाठ्य–पुस्तक में से व्याख्या के लिए चार अवतरण पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो की सप्रसंग व्याख्या करनी होगी । प्रत्येक व्याख्या 6 अंक की होगी । पूरा प्रश्न 12 अंक का होगा ।

2 खण्ड (क) में निर्धारित आलोचनात्मक प्रश्नों में से दो प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को एक प्रश्न का उत्तर देना होगा । यह प्रश्न 8 अंक का होगा ।

3 खण्ड (क) में निर्धारित पाठ्य पुस्तक एवं आलोचनात्मक प्रश्नों में से छः लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं चार प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न के लिए चार अंक निर्धारित हैं । पूरा प्रश्न 16 अंक का होगा ।

4 खण्ड (ख) में निर्धारित आलोचनात्मक प्रश्नों में से चार प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को दो प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न 8–8 अंक का होगा । इस प्रकार यह प्रश्न 16 अंक का होगा ।

5 खण्ड (ख) में निर्धारित प्रश्नों में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं दो प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न के लिए पाँच अंक निर्धारित हैं । पूरा प्रश्न 10 अंक का होगा ।

6 खण्ड (ग) में निर्धारित पाठ्यक्रम में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो प्रश्नों का उत्तर देना होगा । प्रत्येक उप प्रश्न के लिए 5 अंक निर्धारित हैं। पूरा प्रश्न 10 अंक का होगा ।

7 खण्ड (घ) में पूरे पाठ्यक्रम में से 8 वस्तुनिष्ठ प्रश्न पूछे जाएंगे । प्रत्येक प्रश्न 1 अंक का तथा पूरा प्रश्न 8 अंक का होगा।

संयुक्त पाठ्यक्रम
(इन्दिरा गाँधी विश्वविद्यालय,महर्षि दयानन्द विश्वविद्यालय और कुरुक्षेत्र विश्वविद्यालय के लिए)
बी0ए0 षष्ठ सेमेस्टर
जनवरी 2014
हिन्दी (अनिवार्य)

समय : 3 घण्टे

कुल अंक :   100
लिखित परीक्षा :   80 अंक
आंतरिक मूल्यांकन : 20 अंक

निर्धारित पाठ्यक्रम
- नव्यतर विधाओं पर आधारित पाठ्यपुस्तक, ;कुरुक्षेत्र विश्वविद्यालय, कुरुक्षेत्र सम्पादितद्ध
- हरियाणवी लोक साहित्य का इतिहास
- हिंदी पत्रकारिता
- वस्तुनिष्ठ प्रश्न

खण्ड क : प्रस्तावित निर्धारित पाठ्यपुस्तक

षष्ठ सेमेस्टर हिंदी (अनिवार्य) की नव्यतर गद्य विधाओं पर आधारित पाठ्यपुस्तक (जिसका नामकरण पुस्तक–निर्माण के साथ किया जाएगा) कुरुक्षेत्र विश्वविद्यालय, कुरुक्षेत्र का हिंदी–विभाग तैयार करेगा। कुरुक्षेत्र विश्वविद्यालय, कुरुक्षेत्र के हिंदी–विभाग का दायित्व होगा कि पाठ्यक्रम प्रभावी होने से पहले वह पाठ्यपुस्तक विद्यार्थियों को उपलब्ध कराए ।

प्रस्तुत प्रस्तावित पाठ्य पुस्तक में निम्नलिखित लेखकों की रचनाओं को शामिल किया जाएगा–

1 (निबन्ध)   : बालमुकुन्द गुप्त
2 (निबन्ध)   : आचार्य रामचन्द्र शुक्ल
3 (संस्मरण)   : महादेवी वर्मा
4 (ललित निबन्ध)   : आचार्य हजारीप्रसाद द्विवेदी
5 (ललित निबन्ध)   : विद्यानिवास मिश्र
6 (व्यंग्य)   : हरिशंकर परसाई
7 (यात्रावृत्तान्त)   : राहुल सांकृत्यायनश्श्श्श्श्श्श्

निर्धारित आलोचनात्मक प्रश्न
पाठ्यक्रम में निर्धारित लेखकों के साहित्यिक परिचय, निबन्धों के वस्तु पक्ष तथा कला पक्ष पर ही प्रश्न पूछे जाएंगे । श्श्श्श्श्श्श्श्श्श्श्श्श्श्श्श्

खण्ड—ख : हरियाणवी भाषा और साहित्य का इतिहास
पाठ्यक्रम में निर्धारित आलोचनात्मक प्रश्न
1 हरियाणवी भाषा का उद्भव और विकास
2 हरियाणवी भाषा की प्रमुख बोलियाँ
3 हरियाणा की सांग परम्परा : उद्भव और विकास
4 हरियाणवी भाषा का आधुनिक साहित्य
    (क) हरियाणवी कविता : परिचय और प्रवृत्तियाँ
    (ख) हरियाणवी का गद्य साहित्य
        1 उपन्यास साहित्य
        2 कहानी साहित्य
        3 नाट्य साहित्य

खण्ड—ग : प्रयोजनमूलक हिंदी : पत्रकारिता
1 पत्रकारिता : स्वरूप एवं प्रकार
2 शीर्षक की संरचना
3 सम्पादक के गुण और दायित्व

4　फीचर लेखन

5　स्वतंत्र प्रेस की अवधारणा

खण्ड—घ　वस्तुनिष्ठ प्रश्न

निर्देश

1　खण्ड (क) में निर्धारित पाठ्य–पुस्तक में से व्याख्या के लिए चार अवतरण पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो की सप्रसंग व्याख्या करनी होगी । प्रत्येक व्याख्या 6 अंक की होगी । पूरा प्रश्न 12 अंक का होगा ।

2　खण्ड (क) में निर्धारित आलोचनात्मक प्रश्नों में से दो प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को एक प्रश्न का उत्तर देना होगा । यह प्रश्न 8 अंक का होगा ।

3　खण्ड (क) में निर्धारित पाठ्य पुस्तक एवं आलोचनात्मक प्रश्नों में से छ: लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं चार प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न के लिए चार अंक निर्धारित हैं । पूरा प्रश्न 16 अंक का होगा ।

4　खण्ड (ख) में निर्धारित आलोचनात्मक प्रश्नों में से चार प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को दो प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न 8–8 अंक का होगा । इस प्रकार यह प्रश्न 16 अंक का होगा ।

5　खण्ड (ख) में निर्धारित प्रश्नों में से चार लघूत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को लगभग 150 शब्दों में किन्हीं दो प्रश्नों का उत्तर देना होगा । प्रत्येक प्रश्न के लिए पाँच अंक निर्धारित हैं । पूरा प्रश्न 10 अंक का होगा ।

6　खण्ड (ग) में निर्धारित पाठ्यक्रम में से चार लघुत्तरी प्रश्न पूछे जाएंगे जिनमें से परीक्षार्थियों को किन्हीं दो प्रश्नों का उत्तर देना होगा । प्रत्येक उप प्रश्न के लिए 5 अंक निर्धारित हैं। पूरा प्रश्न 10 अंक का होगा ।

7　खण्ड (घ) में पूरे पाठ्यक्रम में से 8 वस्तुनिष्ठ प्रश्न पूछे जाएंगे । प्रत्येक प्रश्न 1 अंक का तथा पूरा प्रश्न 8 अंक का होगा।

INDIRA GANDHI UNIVERSITY, MEERPUR - REWARI

(A State University Established under Haryana Act No. 29 of 2013)

Syllabus and Scheme of Examination of B. A. Pass Course English 1st to 6th Semesters

B. A. Part I
English (Compulsory)
Semester I
Literature and Language I

Scheme of Examination

Total Marks: 100
Theory: 80
Int. Assessment: 20
Time: 3 hrs

Prescribed Text :

Mohan, Loveleen, Randeep Rana and Jaibir Singh Hooda eds. *Literature and Language I*, Delhi: Orient Blackswan, 2015 (Revised Edition).

Workload: 8 periods of 45 minutes per week for Text: 2 periods of 45 minutes per week for composition for a group of 20 students.

Instructions to the Paper-setter and Students:

Note: All questions are compulsory.

Q 1 will be based on phonetic transcription given in the chapters in the text book. The students shall transcribe *eight* words out of the given *twelve*.

(08)

Q 2 will comprise very short answer type questions (using a word, a phrase or one or two sentences each) based on the chapters in the text book. The students shall answer any *eight* out of the given *twelve* items.

(08)

Q 3 will comprise inference based questions to elicit the understanding of the text by the students. The students shall answer any *five* out of the given *eight* questions based on the chapters (in about 75-100 words each).

(20)

Q 4 will be based on a comprehension passage from the text followed by *four* questions.

(04)

Q 5 will be based on vocabulary given in the exercises. The students shall attempt questions on vocabulary as directed. (e.g. framing sentences of their own or giving various forms of the given words- synonyms, antonyms, one word substitutes). The students shall answer any *eight* out of the given *twelve* words.

(08)

Q 6 will be based on grammar topics discussed in the text book. It will have two parts – (a) and (b). Part (a) will be based on the use of tenses and Part (b) on parts of speech. Both the parts will carry 12 marks each. There will be 50% internal choice in both the parts.

(24)

Note: Questions will be based on the exercises but not necessarily from the exercises as such.

In Q 7, students will be required to write a Paragraph in about 150 words on any *one* out of the given *three* topics. The topics will be similar to the topics given in the exercises in the text book.

(08)

Scheme of Examination

Total Marks: 100
Theory: 80
Int. Assessment: 20
Time: 3 hrs

Prescribed Text :

Literature and Language II eds. Jaibir S. Hooda, Randeep Rana and Loveleen Mohan.

Workload: 8 periods of 45 minutes duration per week for Text. 2 periods of 45 minutes duration per week for Grammar and Composition for a group of 20 students.

Instructions to the Paper-setter and Students:

Note: All questions are compulsory.

Q.No.1 (a) Transcription of one/two syllabic words only from the words given in the exercises given at the end of the chapters. Students will be required to transcribe any four out of the given eight words.   4 Marks

(b) Antonyms and synonyms from the exercises given at the end of the chapters. Students will be required to give four antonyms and four synonyms out of the given eight each.   4 Marks

Q.No.2 (a) Very short answer type questions. Students will be required to answer any four out of given eight questions in a word/phrase/sentence. The questions may not necessarily be the same as given in the exercises.   4 Marks

(b) Students will be required to attempt any six out of the given nine questions in 2 – 5 sentences/50 words each. Short answer type questions also may not be the same as given in the exercises.   12 Marks

Q.No. 3 Long answer type questions. Students will be required to attempt in about 150 – 200 words each any three out of the given six questions.   21 Marks

Q.No. 4 (a) Grammar: This question will be based on the grammar exercises given in the text. The sentences will not necessarily be the same as given in exercises. There will be 50% internal choice.   20 Marks

(b) One question based on Grammar topics covered in Semester I (with 50% internal choice)
                                                                                                7 Marks

Q.No.5 Composition: Students will be required to write an essay in about 200 words on one of the two given topics with hints for composition.   8 Marks

3

B.A. Part II
English (Compulsory)
Semester III (Session 2015-16)

Scheme of Examination

Total Marks: 100
Theory: 80
Int. Assessment:20
Time: 3 hrs

Prescribed Text:

Fragrances: edited by Dinesh Kumar, Sunita Siroha and S.S. Rehal, and published by Orient Blackswan, New Delhi.

Workload: 8 periods of 45 minutes duration per week for Text. 2 periods of 45 minutes duration per week for Grammar and Composition for a group of 20 students.

Instructions to the Paper-setter and Students:

Note: All questions are compulsory.

Q.No.1. Students will be required to explain any *two* stanzas out of the given *three* with reference to the context. (8 Marks)

Q.No.2. It will comprise very short answer type questions based on the poems in the text book. The students shall answer any *six* out of the given *eight* questions (in about 20 to 30 words each). (6 Marks)

Q.No.3. It will comprise inference based questions to elicit the understanding of the text by the students. The students shall answer any *two* out of the given *three* questions based on the poems (in about 150 to 200 words each). (12 Marks)

Q.No.4. It will be based on a comprehension passage from the text followed by *four* questions. (4 Marks)

Q.No.5. (a) This question will be based on the grammar topics discussed in the text book. The sentences will not necessarily be the same as given in the exercises. Students will be required to attempt any *sixteen* out of the given *twenty four*. (16 Marks)

(b) In this question the students will be required to attempt *two* out of the given *three* questions. The candidates may be asked to identify literary devices from the extracts from the prescribed poems. (6 Marks)

(c) In this question the students will be required to write short note on *two* out of the given *four* poetic forms based on the prescribed poems and discussed in the text book. (6 Marks)

(d) Transcription of any *six* words out of the given nine from the text (not more than trisyllabic words). (6 Marks)

(For visually challenged students only)

Students will be required to write a paragraph in about 100 words on any *one* out of the given *three* paragraphs of general nature.

(e) Vocabulary exercise. The student will attempt any *eight* out of the given *twelve* vocabulary based items (not necessarily the same as given in the exercises). (8 Marks)

Q.No.6 Composition: Students will be required to write an essay in about 200 words on any *one* of the four given topics of general nature. (8 Marks)

UGBOS dt 20.01.2016

4

Scheme of Examination

Total Marks: 100
Theory: 80
Int. Assessment: 20
Time: 3 hrs

Prescribed Text:

Centre Stage edited by Sunita Siroha, S.S. Rehal and Dinesh Kumar and published by Orient Blackswan, New Delhi.

Workload: 8 periods of 45 minutes duration per week for Text. 2 periods of 45 minutes duration per week for Grammar and Composition for a group of 20 students.

Instructions to the Paper-setter and Students:

Note: All questions are compulsory.

Q.No.1. Explanation of one extract out of the given two with reference to the context.   (8 Marks)

Q.No.2.(a) Very short answer type text-based questions: Students will be required to answer any six out of the given eight questions in a word/phrase/sentence.   (6 Marks)

(b) Students will be required to attempt any two out of the given three questions based on the text in 100 words each. Short answer type questions also may not be the same as given in the exercises.

(6+6 Marks)

Q.No.3. Long answer type question based on the text, to be answered in about 300 words on any one of the given two questions. The questions will be designed to test the candidate's critical understanding of the text.   (12 Marks)

Q.No.4(a)Writing Skills: This question, with internal choice, will be based on the topics discussed in the text-book under the title "Extended Language Skills" except "Translation".   (15 Marks)

(b) Students will be required to transcribe and mark primary stress on any ten words out of the given fifteen words.   (10 Marks)

(For visually challenged candidates only) There will be a question based on vocabulary.

(c) Vocabulary exercise (any five out of the given eight).   (5 Marks)

Q.No.5 Translation:

(a) Students will be required to translate one short passage from Hindi into English.   (6 Marks)

(b) Students will be required to translate one short passage from English into Hindi.   (6 Marks)

Or (In lieu of translation for Foreign students only)

Make a précis of a prose passage (300 words).   (12 Marks)

UGBOS dt 20.01.2016

Scheme of Examination

Total Marks: 100

Theory: 80

Int. Assessment: 20

Time: 3 Hours

Prescribed Text: To be got published by CDLU, Sirsa

Work Load: 8 Periods of 45 minutes duration per week for Text and 2 periods of 45 minutes duration per week for composition for a group of 20 students

Instructions to the Paper-Setter and Students

In Question 1, students will be required to answer any *four* out of the given *six* in about 100 words each from the prescribed text.

4x4 =16

Question 2 will be an essay type question (with internal choice) from the prescribed text. 14

In Question 3, students will be required to give answers to the questions that follow a passage from the prescribed text.

6

In Question 4, students will be required to write short notes on any *three* literary terms out of the given *five*. Students are also required to illustrate the term by citing from the prescribed text. 3x3 =9

Question 5 will be a 'Do as Directed' type question based on following items:

(A) Conversion of Sentences – from simple to compound and complex sentences. 6

(B) Conditional Clauses
6

(C) Defining and Non-Defining Clauses
6

[Standard Grammar books like *A Handbook of English Grammar* by R. W. Zandvoort and *A Comprehensive Grammar of English Language* by Randolph Quirk]

In Question 6, students will be required to develop a short story on the basis of the given outline/hints

5

In Question 7, students will be required to make a précis of a passage of about 300 words. 12

B.A.III English (Compulsory)

Semester VI Jan.2017

(w.e.f. Session 2016-17)

Title – *Interpreting A Play: The Merchant of Venice*

&

Developing Composition Skills

Edited by Deepti Dharmani, Pankaj Sharma and Umed Singh :

Macmillan Publishers India Pvt.Ltd.

A Compulsory textbook prescribed for BA 6th Semester

CDLU Sirsa, MDU Rohtak, KU Kurukshetra

Work Load :   8 periods of 45 minutes a week for Text

2 periods of 45 minutes a week for composition for a group of 20 students

Text: To be prepared and got published by CDLU, Sirsa

Scheme of Examination

Total Marks	:	100
Theory	:	80
Internal Assessment :		20

Time 3 Hours

Instructions to the Paper Setter and the Students

Q.1 a)   Explanation with reference to the context of a given passage (with internal choice) taken from the prescribed text.   8

b)   Short answer type questions: Students will be required to give answers (in about 50 words) to five questions out of given eight questions based on the prescribed text: $3 \times 5 = 15$

Q.2   Students will be required to attempt one essay type question based on the prescribed text (with internal choice).   12

Head,
Dep... English
and ...

Q.3 a) Students will be required to write a précis of an unseen prose passage of about 400 words. 10

b) Students will be required to attempt a summary/abstract of a given unseen passage of about 250 words. 10

c) Students will be required to attempt one word substitute of any five of the given eight: This question will be set from the prescribed text book. 5

Q.4 Letter Writing: Business & Official letters based on the text but not necessarily the same.

Students will be required to attempt one of the given two. 10

Q.5 Comprehension of an unseen passage 10

Head,
Department of English
and Foreign Lgs.,
M. D. University,
ROHTAK.

ENGLISH

B.Sc. 1st Year : (2nd SEMESTER)

Max Marks : 50   Time allotted : 3 Hrs

PART A : IDEAS AGLOW   22

The following text is prescribed for intensive study :

1. Following poems form **Ideas Aglow** edited by Dinesh **Kumar and** V.B. Abrol
    (Publication Bureau, Kurukshetra University, Kurukshetra.)

    (a) C.E.M. Joad
         Our Civilization
    (b) Jayant V. Narlikar
         It's Question Time
    (c) N. Ram
         An interview with Christian Barnard
    (d) B.R. Ambedkar
         Untouchability and the Caste System
    (e) Huck Gutam
         Inhumanisation of War
    (f) Amartya Sen
         Seven Types of Gender Inequality

PART B : GENERAL ENGLISH   18

1. Translation form English to Hindi   5
2. Precis   6
3. Official Correspondence : Letter Writing   7

Schemes of Examination :

The paper will have seven question as per details given below :

1. The candidate will be asked to answer comprehension questions based on a passage
    form the text-book. There will be internal choice.   1×4=4
2. The candidate will be asked to explain with reference to the context a passage form
    the text-book. There will be internal choice.   1×4=4
3. There will be four short answer type questions based on the text-book The candidate
    will be asked to give answers in about 30 words each. There will be internal choice.
                                                                            2×3=6
4. There will be two essay type question based on the text-book with internal choice. 8
5. Translation of passage of about 10 sentences form English to Hindi.   5
6. Precis : The candidate will be required to summarize a given passage in contemporary
    English of about 250 words to one-third of its length and also given a suitable heading. 6
7. The candidate will be asked to write an official letter. There will be internal choice. 7

ENGLISH

B.Sc.–1 (1st Semester)

Max Marks : 40

Time allotted : 3 Hrs

PART-A (TEXT)

20 Marks

The following text is prescribed for intensive study :

1. Following poems form CHRONICLES OF TIME edited by *Asha Kadyan* (Oxford University Press)

   (a) William Shakespeare
       "Let Me Not to the Marriage of True Minds"

   (b) John Donne
       "Death Be Not Proud"

   (c) John Milton
       "On His Blindness"

   (d) Henry Vaughan
       "The Retreat"

   (e) John Dryden
       "Shadwell"

   (f) Alexander Pope
       "Know Then Thyself"

   (g) William Blake
       "The Little Black Boy"

   (h) William Wordsworth
       "Three Years She Grew in Sun and Shower"

   (i) Percy Bysshe Shelley
       "England in 1819"

   (j) Alfred, Lard Tennyson
       "Crossing the Bar"

PART–B : GENERAL ENGLISH

20 Marks

1. Translation from Hindi to English   4
2. Paragraph Writing   6
3. Common Phrasal Verbs, Prepositions and Common Errors in English.   10

Maharshi Dayanand University
Rohtak

Ordinances, Syllabus and Courses of
Reading for

B. A. Ist year History (Pass Course)
I & II Semester Examination

Session 2014-2015

Scheme of Examination of B.A. 1st year History (Pass Course)
2014-15

1st Semester

Name of the Paper	Max. Marks	Theory	Internal Assessment	Time
Paper-I: History of India (Earliest times to c. 1200 A.D.)	100	80	20	3Hrs.

2nd Semester

Paper-II : History of India (c. 1200 A.D. to 1707 A.D.)	100	80	20	3Hrs.

Scheme of Examination of B.A. 2nd year History (Pass Course)
2015-16

3rd Semester

Paper-III : History of India (c. 1707 to 1947 A.D.)	100	80	20	3Hrs.

4th Semester

Paper-IV : History of Haryana (Earliest Times to 1947 A.D.)	100	80	20	3Hrs.

Scheme of Examination of B.A. 3rd year History (Pass Course)
2016-17

5th Semester

Paper-V: Ancient & Modern World	100	80	20	3Hrs.

6th Semester

Paper-VI : Modern World	100	80	20	3Hrs.

B.A. Ist year History (Pass Course) : Ist Semester

Paper-I : History of India (earliest times to c. 1200 A.D.)

Max. Marks	:	100
Theory	:	80
Internal Assessment	:	20
Time	:	3 Hrs.

Note: The paper setter shall set nine questions in all, taking two questions from each unit and one compulsory question (Q.No. 9) containing eight short answer type questions of two marks each covering the entire syllabus. The candidate shall attempt five questions in all selecting one question from each unit and the compulsory question. All questions shall carry equal marks.

Unit-I

1. **Reconstructing and Interpreting Ancient India**
    a. Defining History, History and Past
    b. Sources of Ancient India
2. **Pre-Historical Age**
    a. Main features of Palaeolithic, Mesolithic and Neolithic Cultures of India
3. **Harappan Civilization**
    a. Origin, Extent and Town Planning
    b. Economy and Religion
    c. Problem of Decay

Unit-II

4. **The Vedic Age (c.1500 B.C. to 600 B.C.)**
    a. Social, Economic Activities
    b. Political, Religious Activities
5. **Second Urbanization and the rise of Territorial States**
6. **New Religious Movements :** Jainism & Buddhism
7. **a. Foreign Invasions:** Achaemenian and Masedonian, their Impacts.
    b. Mauryan Empire: Formation and Consolidation
                     : Ashoka's Dhamma
                     : Social and Economic condition
                     : Decline of Empire
8. **Post Mauryan Age**
    a. The Kushanas
    b. Satavahanas
    c. Cholas
9. **Gupta Empire**
    a. Formation and Consolidation
    b. Contribution to Indian Culture
    Post Gupta period
    a. Pushpabhutis
    b. Tripartite Struggle- Pratiharas, Palas, Rastrakutas
    c. Arab & Turkish invasions and their Impacts

Unit-IV

Maps:
1. Important sites of Harappan Civilization
2. Extent of Ashoka's Empire and Pillar Edicts
3. Ports and Trade routes of Ancient India
4. Extent of Kushana's Empire

5.   Extent of Harshavardhana Empire

Suggested Readings :

Jha, D.N.	*Prachin Bharat*, Hindi Madhyam Karyanvaya Nideshalaya, University of Delhi, 1995
Jha , D.N.and K.M. Srimali (ed.)	*Prachin Bharat ka Itihas*, Hindi Madhyam Karyanvaya Nideshalaya , University of Delhi, 2007
Majumdar, R.C.	*Prachin Bharat*, Motilal Banarsidass, Delhi, 1973
Mukharjee, R.K.	*Prachin Bharat*, Raj Kamal Prakashan, New Delhi, 1990
Pandey, A.B.	*Purva Madhyakalin Bharat*, Central Book Depot, Allahabad, 1999 (Rev. edn.)
Raychaudhry, H.C.:	*Political History of Ancient India*, University of Calcutta, 1972
Sharma, R.S.	*Aspects of Political Ideas and Institutions in Ancient India* Motilal Banarasidass, Delhi, 1996 (Rev. Edn.)
Sharma, R.S.	*Prarambhik Bharat ka Aarthik aur Samajik Itihas*, Hindi Madhyam Karyanvaya Nidishalaya, University of Delhi, 2000.
Thapar, Romila	*Adikalin Bharat ki Vyakhya*, Granth Shilpi, Delhi, 2008
„	*Ancient Indian Social History*, Orient Longman, New Delhi, 2004
„	*A History of India*, Vol. I, Penguin, 1966
„	*Ashok aur Maurya Samrajya ka Patan*, Granth Shilpi, Delhi, 1997
„	*Interpreting Ancient India*, Granth Shilpi, New Delhi, 1985
„	*Vansh se Rajya Tak*, Granth Shilpi, New Delhi, 2004

:

B.A. Ist year History (Pass Course) : IInd Semester

Paper-II : History of India (c.1200 A.D. to 1707 A.D.)

Max.Marks	:	100
Theory	:	80
Internal Assessment	:	20
Time	:	3 Hrs.

Note: The paper setter shall set nine questions in all, taking two questions from each unit and one compulsory question (Q.No. 9) containing eight short answer type questions of two marks each covering the entire syllabus. The candidate shall attempt five questions in all selecting one question from each unit and the compulsory question. All questions shall carry equal marks.

Unit-I
1. **Reconstructing and Interpreting Medieval India** : Definition, Sources
2. **Delhi Sultanate:** Establishment and Consolidation under Early Turks-Aibek, Iltutmish, Balban
3. **Expansion of Delhi Sultanate** under Khiljis and Tughlaqs, Disintegration of Delhi Sultanate

Unit-II
4. **India on the eve of Babur's invasion:** His major achievements
5. **Second Afghan Empire:** Shershah Suri and his major achievements
6. **Consolidation and Expansion of Mughal Empire :** Akbar, Jahangir, Shahjahan, Aurangzeb

Unit-III
7. **Administrative Institutional Developments:** Iqtadari, Mansabdari
8. **Economic Aspects during Medieval Period :**
   a. Land Revenue System
   b. Industries, Trade and Commerce
9. **Socio-Religious Life during Medieval Period :**
   a. Bhakti Movement
   b. Sufi Movement
   c. Din-e-Ilahi
   d. Art and Architecture

Unit-IV
Map:
   1. Extent of Sultanate under Alauddin Khalji
   2. Urban Centres during Sultanate period
   3. Political Condition of India on the eve of Babur's invasion
   4. India under Akbar(1605 A.D.)
   5. India under Aurangzeb(1707 A.D.)

Suggested Readings :

Chandra, Satish	*Madhyakalin Bharat* (Sultanate to Mughals), Vol. I & II, Jawahar Publication, New Delhi, 2000, 2001
Dodwell, H.H. (ed.)	*The Cambridge History of India,* Vol. V, S. Chand & Co., New Delhi, 1986
Habibulla, A.B.M.	*Foundation of Muslim Rule in India*, Central Book Depot, Allahabad, 1976
Pandey, A.B.	*Uttar Madhyakalin Bharat,* Vol. III, Panchsheel Prakashan, Kanpur, 1976
Sharma, G. D.	*Madhyakalin Bharat ki Samajik, Arthik aur Rajnitik Sansthayen*, Rajasthan Hindi Granth Academy, Jaipur, 1990
Srivastava, A.L.	*Madhyakalin Bhartiya Sanskriti*, Shivlal & Agrawal Company Prakashan, Agra, 1975
Verma, H.C.	*Madhyakalin Bharat,* Vol. I & II, Hindi Madhyam, Karyanvaya Nideshalaya, University of Delhi , 2000

B.A. 2nd year History (Pass Course) : IIIrd Semester

Paper -III : History of India (c.1707-1947 A.D.)

Max.Marks	:	100
Theory	:	80
Internal Assessment	:	20
Time	:	3 Hrs.

Note: The paper-setter shall set nine questions in all, taking two questions from each unit and one compulsory question (Q.No. 9), containing eight short answer type questions of two marks each, covering the entire syllabus. The candidate shall attempt five questions in all, selecting one question from each unit and the compulsory question. All questions shall carry equal marks.

Unit-I

1. **Disintegration of central authority**

   a. Decline of Mughal Empire and Rise of successor states
   b. British Conquest of India: its nature: a brief survey-
   Eastern India- Bengal; Southern India- Mysore and Marathas ;North and
   Western India-Awadh, Sind and Punjab

2. **Consolidation of British rule and resistance**

   a. Administration and Foreign policy
   b. Early resistance and Revolt of 1857

Unit-II

3. **Society of India**
   a. Social condition in 18th century
   b. Indian cultural renaissance
   c. Social impact of British rule

4. **Economy of India**
   a. Economic condition in 18th century
   b. British land revenue policy
   c. Rise of Modern Industry
   d. Economic impact of British rule

Unit-III

5. **Emergence of Nationalism**
   a. Causes of the emergence of National Movement
   b. Indian National Congress and National Freedom Movement (1885-1947)
   c. Revolutionaries

6. **Towards Freedom**

   a. Constitutional Development: 1909 to 1935
   b. Emergence of Communal and separatists politics
   c. Negotiations for independence and transfer of power

Unit-IV

Maps
1. India during 1764
2. Important places of 1857 Revolt
3. Centers of socio-religious movements.
4. Important places of Revolutionary Movements.
5. Places associated with significant sessions of Indian National Congress

Suggested Readings:

Bipan, Chandra(ed.)	*Bharat ka Swatantrata Sangharsh*, Hindi Madhyam Karyanvay Nideshalay, University of Delhi, 1998
Desai,A.R.	*Bhartiya Rashtravad ki Samajik Prishthabhumi,* Macmillan, Delhi, 1967
Kashyap, Subhash	*Swtantrata Andolan ka Itihas*, Hindi Madhyam Karyanvay Nideshalay, University of Delhi,1997
Ray, Satya M.(ed.)	*Bharat mein Upniveshwad aur Rashtravad*, Hindi Madhyam Karyanvay

	Nideshalay , University of Delhi,1986
Sarkar,Sumit	*Adhunik Bharat*, Rajkamal Publication, Delhi, 1999
Sharma, Ramvilas	*Swadhinta Sangram ke Badalte Paripeksh*, Hindi Madhyam Karyanvay Nideshalay, University of Delhi, 1995
Spear, Percival	*Oxford History of India*, Oxford University Press, New Delhi,1974
Stokes,Eric	*Peasant and the Raj*, Cambridge University Press, Delhi, 1975
Sukla,R.L.(ed*.)*	*Adhunik Bharat ka Itihas*, Hindi Madhyam Karyanvay Nideshalay, University of Delhi,1990
Tara Chand	*History of the Freedom Movement in India*, Vol. 1 to 4, The Publication Division, Ministry of Information and Broadcasting, Delhi,1961
Verma, H.C. (ed.)	*Madhya Kaleen Bharat*,(1540-1761),Vol.2 Hindi Madhyam Karyanvay Nideshalay, University of Delhi, 2002

B.A. 2nd year History (Pass Course) : IVth Semester

Paper-IV: History of Haryana (from earliest times to 1947 A.D.)

Max.Marks	:	100
Theory	:	80
Internal Assessment	:	20
Time	:	3 Hrs.

Note: The paper-setter shall set nine questions in all, taking two questions from each unit and one compulsory question (Q.No. 9), containing Eight short answer type questions of two marks each, covering the entire syllabus. The candidate shall attempt five questions in all, selecting one question from each unit and the compulsory question. All questions shall carry equal marks.

Unit-I

1. Regional Study : A case of Haryana
   a.   General survey of sources of the History of Haryana
   b.   Stone age in Haryana: A brief survey
   c.   Harappan Civilization : General features

2. Towards State Formation
   a.   Kurus, Historicity of the battle of Mahabharata
   b.   Rise of Republics: Yaudheyas and Agras

3. Rise of Powers during Early Medieval Period
   a.   Pushpabhutis
   b.   Tomars

Unit-II

4. Battles and Revolts during Medieval Period
   a.   Battles of Tarain and their impact
   b.   Battles of Panipat and their impact
   c.   Resistance of Jats, Revolt of Satnamis

5. Political Developments in 18th Century
   a.   Nawabi Kingdoms and Intrusion of Sikhs
   b.   Marathas, George Thomas and East India Company

Unit-III

6. Political and Social Reactions of British Rule
   a.   Revolt of 1857
   b.   Arya Samaj
   c.   Spread of Modern Education

7. Freedom Movement in Haryana
   a.   Political consciousness and peoples' participation-1885-1919

8. Towards Freedom
   a.   Mass Movements: Non-co-operation and Quit India Movement
   b.   Unionist Party
   c.   Praja Mandal Movement: A brief Survey

<div align="center">

Unit-IV

</div>

Maps

1. Main centres of Harappan civilization in Haryana
2. Haryana at the time of Harshavardhana
3. Urban centres(1200 AD to 1700 AD) during Medieval Period
4. Major centres of 1857 Revolt in Haryana
5. Main centres of Freedom Struggle in Haryana

Suggested Readings:

Buddha Prakash	*Glimpses of Haryana*, Kurukshetra University Press, Kurukshetra, 1967
Buddha Prakash	*Haryana Through The Ages*, Kurukshetra University Press Kurukshetra, 1976
Fredman, J.L.,Lodrick, D.O. and Rudolph, L.I.(eds.)	*The Idea of Rajasthan: Exploration in Regional Identity*, Manohar Publication, New Delhi, 2001
Mittal, S.C.	*Haryana: Historical Perspective*, Atlantic Publishers, New Delhi, 1986
Phadke,H.A.	*Haryana: Ancient and Medieval*, Harman Publishing House, New Delhi, 1999
Rai, Gulshan	*Formation of Haryana*, B.R.Publishing Corporation, Delhi,1987
Singh, Pardaman & Shukla, S.P	*Freedom Struggle in Haryana and the Indian National Congress (1885-1985),* Chandigarh, 1985
Shukla, S.P.	*India's Freedom Struggle and the Role of Haryana*, Criterion Publications, New Delhi, 1985
Yadav, J.N.Singh	*Haryana Studies in History and Politics*, Manohar Publication, Delhi, 1976
Yadav, K.C	*Haryana Itihas evam Sanskriti*, Vol. 1-2, Manohar Publication, Delhi, 1998
Yadav, K.C.	*Haryana Ka Itihas,* Vol. 1-3. Macmillan, New Delhi, 1982

B.A. III Year (Pass Course) - Semester V

Paper - V : Ancient and Medieval World

Max Marks	:	**100**
Theory	:	**80**
Internal Assessment	:	**20**
Time	:	**3 Hrs.**

Unit – I

1. **Pre-Historic Cultures**
   (a) Hunting stage (Paleolithic)
   (b) Hunting – gathering stage (Mesolithic)
   (c) Food producing stage (Neolithic)

2. **Bronze Age Civilizations**
   (a) Sumerian Civilization : Socio-economic structure
   (b) Egyptian Civilization : Socio-economic structure
   (c) Indus Civilization : Socio-economic structure

Unit - II

3. **Iron age civilizations**
   (a) Greek civilization : Polity, Society and Economy
   (b) Roman civilization : Polity, Society and Economy
   (c) Indian civilization : P.G.W. Culture

4. **Feudalism in Medieval Europe**
   (a) Feudalism : Definition, Rise, Features and Decline
   (b) Role of Church in Medieval Europe

Unit – III

5. **Islamic World**
   (a) Rise of Islam : Socio-Political background of Pre-Islamic Arabia, Evolution of Islamic State under Prophet Muhammad, Pious Caliphs
   (b) State under Umayyads and Abbasids; Intellectual and cultural contribution of the Arab civilization

6. **Transition of Europe from Medieval to Modern Period :**
   (a) Renaissance : Rise and it's impact
   (b) Reformation : Rise and it's impact

Unit IV

7. **Map Work**
   a. Indus valley civilization
   b. Main centers of Greek-Roman civilization
   c. Formation of empire under Abbasids

Suggested Readings

Anderson, Perry   Passages from Antiquity to Feudalism, Verso Publication, London, 1978.

Andes, Antony   Greek Society, Penguin, London, 1975 (reprint)

Childe, G.   What Happened in History, Penguin Books, London, 1964

Clark, Grahame   World Prehistory in New Perspective, Cambridge University Press, 1996 (reprint)

Duby, Shayam Charan   Manav aur Sanskriti, Raj Kamal, Delhi 1993.

Goyal, Shriram   Vishva ki Prachin Sabhyatayen, Vishavavidyalaya Prakashan, Varanasi, 1994

Pandey, Jainender   Puratattva Vimarsh, Prachya Vidya Sansthan, Allahabad, 1983

Pathak, Sushil Madhav   Vishva ki Prachin Sabhyataon ka Itihas, Bihar Hindi Granth Academy, Patna, 1986

Possehl, Gregory (ed.)   Harappan Civilization: Contemporary Perspective, Oxford

	University Press, 1982
Ray, Uday Naraian	Vishva Sabhyata ka Itihas, Lok Bharti, Allahabad, 1982
Sahu, Kishori Prasad	Islam Udbhava aur Vikas, Bihar Hindi Granth Academy, Patna, 2008
Sharma, Devprakash	Bharat evam Sindhu Sabhyata, Sharda Publishing House, Delhi, 1999
Salmon, T. Edward	A History of the Roman World, Methuen & Co., London, 1968
Shukla, Sankta Prasad & Singh, Rajender	Vishav Ki Prachin Sabhaytaye Avam Sansthaye, Pointer Publication, Jaipur, 2003
Shukal, Sankta Prasad & Thaplyal, Kiran Kumar	Sindhu Sabhyata, Uttar Pradesh Hindi Granth Academy, Lucknow, 1976
Virotam, Bal Mukund	Madhayakalin Europe ka Itihas, Bihar Hindi Granth Academy, Patna, 1985
Wheeler, Mortimer	Prithvi se Puratatva, Vaigyanik tatha Takniki Shabdawali Aayog, New Delhi, 1968

B.A. III Year (Pass Course)- Semester VI

Paper VI : Modern World

Max Marks	:	100
Theory	:	80
Internal Assessment	:	20
Time	:	3 Hrs.

Note: The paper setter shall set nine questions in all taking two question from each unit and one compulsory question (Q. No. 9) containing Eight short answer type questions of two marks each covering entire syllabus. The candidate shall attempt five questions in all selecting one question from each unit and the compulsory question. All questions shall carry equal marks.

Unit – I

1. **Economic Development – I**
   - (a) Mercantilism
   - (b) Agricultural Revolution
   - (c) Technological Revolution
2. **Economic Development – II**
   - (a) Capitalism – Its stages and development
   - (b) Imperialism – Its theories and development

Unit - II

3. **Political Development – I**
   - (a) French Revolution
   - (b) Liberalism in Britain
   - (c) Nationalism in Germany & Italy
4. **Political Development – II**
   - (a) Russian Revolution
   - (b) Fascism in Italy
   - (c) Nazism in Germany

Unit – III

5. **Colonialism**
   - (a) Stages of Colonialism in India
   - (b) China and the West
   - (c) Japan and the West
6. **World in the Crisis**
   - (a) Ist World War and peace settlements
   - (b) IInd World War
7. **Non-Alignment Movement**
   - (a) Origin
   - (b) Development

Unit IV

8. **Maps**
   - i. Area of Agriculture Revolution
   - ii. Europe on the eve of French Revolution
   - iii. Unification of Italy
   - iv. Unification of Germany

Suggested Readings

Chauhan, Devender Singh	Europe ka Itihas, Madhay Pradesh Hindi Garanth Academy, Bhopal, 1996
Derfler, Leslie	Europea wampanth ke sau varsh (Socialism since Marx) Macmillan, Delhi ,1977.
Fisher, H.A.L.	History of Europe 2. From the Beginning of the Eighteenth Century of 1935.
Grant, Arthur James and Temperley, Harold	Europe in the Nineteenth and Twentieth Centuries, Vol. I-II, Longman, London, 1976
Gupta, Parthasarthi (ed.)	Europe ka Itihas, Delhi : Hindi Madhyam Karayavan Nideshalaya, University of Delhi, 1993 (reprint)
Jain & Mathur	Adhunik Vishva ka Itihas (1500-2000), Jain Prakashan Mandir, Jaipur, 2002
Phukam, Meenaxi	Rise of the Modern West : Social and Economic History of Early Modern Europe, Macmillan, Delhi, 1998
Rai, Kaulaswar	Adhunik Europe (1789-1945), Kitab Mahal, Allahabad, 1986
Sinha, Arvind	Sankranti Kaleen Europe, Granth Shilpi, Delhi, 2009
Thomson, David	Europe since Napoleon, Penguin Books, London, Reprinted, 1990
Vijay, Devesh	Adhunik Europe Ka Itihas, Delhi : Hindi Madhyam Karayanvan Nideshalaya, Delhi Vishwvidhyalaya, 2010
Vijay, Devesh (ed)	Europia Sanskriti (1400-1800), Delhi : Hindi Madhyam Karayanvan Nideshalaya, Delhi Vishwvidhyalaya, 2009

Indira Gandhi University, Meerpur- Rewari

(A State University Established under Haryana Act No. 29 of 2013)

DEPARTMENT OF GEOGRAPHY

Syllabi and Scheme of Examination of Geography in B.A (Pass Course)

w.e.f. the academic session 2020-21

PREFEACE

The papers of Geography are introduced in the Bachelor of Arts (B.A.) which is a three-year full time degree course consisting of six semesters. Each semester shall consist of one theory and one practical paper of geography. Each course of these semesters will carry 100 marks of which 15 marks will be for internal assessment and 60 marks for theory paper. The marks of practical paper are 25.

The syllabus of the papers (courses) has been divided into four units. There shall be nine questions in all. The first question would be compulsory, shall be short answer type. It would carry six short questions from the entire syllabus. The candidate will be required to attempt all questions. Each short answer type question would carry two marks ($06\times2=12$ marks). There shall be two questions from each unit and the candidate shall be required to attempt one question from each unit. Each unit shall carry 12 marks ($12\times4=48$ Marks) The duration of the examination shall be three hours. The evaluation pattern for these examinations shall be as per the University regulations. The medium of instruction shall be both English and Hindi.

Note: The break–up of marks & pattern for Internal Assessment & attendance component shall be as per university rules.

Indira Gandhi University, Meerpur- Rewari
B.A. Geography (Pass Course)
with effect from the Academic Session 2020-21

B.A. FIRST YEAR - Semester-I w.e.f. 2020-21

Sr. No	Course Code	Nomenclature of the course	Theory	Internal Assessment	Practical/ Lab	Total
I	UG-GEO 101	Geography of India	60	15	-	75
II	UG-GEO 102	Maps and scales (Practical)	-	-	25	25
	Semester-II					
III	UG-GEO 103	Physical Geography-I	60	15	-	75
IV	UG-GEO 104	Representation of Physical Features (Practical)	-	-	25	25
	B.A. SECOND YEAR- Semester-III w.e.f. 2021-22					
V	UG-GEO 201	Physical Geography-II	60	15	-	75
VI	UG-GEO 202	Representation of Climatic Data and Survey (Practical)	-	-	25	25
	Semester-IV					
VII	UG-GEO 203	Human Geography	60	15	-	75
VIII	UG-GEO 204	Maps projections and Survey (Practical)	-	-	25	25
	B.A. THIRD YEAR- Semester-V w.e.f. 2022-23					
IX	UG-GEO 301	Economic Geography	60	15	-	75
X	UG-GEO 302	Distribution Maps, Diagrams and Survey (Practical)	-	-	25	25
	Semester-VI					
XI	UG-GEO 303	Introduction to Remote Sensing, GIS and Quantitative Methods	60	15	-	75
XII	UG-GEO 304	Introduction to Remote Sensing and Field Survey Report (Practical)	-	-	25	25

B.A. GEOGRAPHY (PASS COURSE) - FIRST YEAR
(FIRST SEMESTER)

Learning Outcomes and Objectives

1. To familiarize the students with the physiography of India and Haryana.
2. To provide the students an acquaintance with the demographic component of India and Haryana.
3. The aim of this course is to introduce the students to the economy and various types of resources in India and Haryana.

B.A (GEOGRAPHY) – FIRST SEMESTER
GEOGRAPHY OF INDIA
UG – GEO 101

Maximum Marks: 75
External Assessment Marks: 60
Internal Assessment Marks: 15
Time: 3 Hours

Note: There shall be nine questions in all. The candidates have to attempt five questions including Question- 1 which is compulsory comprising six short questions to be answered in 15-20 words each. In addition, the candidates have to attempt four more questions selecting at least one from each unit. All questions carry equal marks.

UNIT- I
1.   India: locational setting; relief and drainage systems.
2.   Climate of India, climatic regions, drainage system of India, soils, natural vegetation, natural hazards- drought and flood.
UNIT – II
3.   Population: distribution, density and growth.
4.   Literacy, age & sex composition and levels of urbanization, migration pattern in India
UNIT- III
5.   Distribution and production of major crops; Rice, Wheat, Cotton and Tea; Irrigation, Green Revolution and problems of Indian Agriculture.
6.   Industries- iron and steel, cotton textile, sugar and petrochemical industries and industrial regions of India.
UNIT-IV (HARYANA)
7.   Introduction to physiography and soil degradation.
8.   Demographic aspects – growth of population, literacy, sex ratio and urbanization.
9.   Agriculture, Industry and Transport.

Suggested Readings

1.   Deshpande D: India – A Regional Interpretation, Northern Book Depot, New Delhi, 1992.
2.   Singh, Gopal: Geography of India, Atma Ram and Sons, 2006.
3.   Shafi, M: Geography of South Asia, McMillan and Company, Calcutta,2000.
4.   Singh, R L (ed): India: A Regional Geography, National Geographical Society, India, Varanasi,1971.
5.   Singh, Surender and Saroha, Jitender: Geography of India, Access Publishing India Pvt. Ltd., New Delhi,2014.
6.   Spate, D H K and ATA Learmonth: Indian and Pakistan – Land, People and Economy, Methnen and Company, London,1967.
7.   Tiwari, R.C. (2007) Geography of India, Prayag Pustak Bhawan, Allahabad.
8.   Sharma, T.C. (2013) Economic Geography of India, Rawat Publication, Jaipur.

B.A (GEOGRAPHY) – FIRST SEMESTER
MAPS AND SCALES (PRACTICAL)
UG- GEO 102

Distribution of Marks   **Maximum Marks: 25**
Exercises=15   **Time: 3 Hour**
Record File=05
Viva-voce=05

Note: There will be four questions in all and candidate has to attempt three exercises.

		Exercises
1.	Introduction to Cartography	
2.	Maps and their types	
3.	Map Scales	
a.	Methods of Expressing a scale	2
b.	Conversion of Statement of Scale into R.F. and vice –versa.	1
c.	Plain Scale (Km and mile)	2
d.	Comparative Scale	4
e.	Diagonal Scale	1
4.	Measurement of Distances and Areas on Maps	2
5.	Enlargement and Reduction of Maps	2

Suggested Readings

1. F.J. Monkhouse and H.R. Wilkinson (1972) Maps and Diagrams, Methuen and Co. Ltd., London

2. L.R. Singh and Raghuvander Singh (1973), Map Work and Practical Geography, Central Book Depot, Allahabad.

3. R.I. Singh and P.K. Dutt (1968), Elements of Practical Geography, Students Friends, Allahabad.

4. Singh Gopal (2004) 4 th edition, Map Work and Practical Geography, Viksa Publication House.

B.A. GEOGRAPHY (PASS COURSE) - SECOND SEMESTER

Learning Outcomes and Objectives:

1. To enable students understand the processes of endogenetic and exogenetic movements of the earth.
2. To introduce the students to the concept of cycle of erosion and various agents of gradation shaping the earth.

B.A. GEOGRAPHY - SECOND SEMESTER
PHYSICAL GEOGRAPHY-I
UG - GEO 103

Maximum Marks: 75
External Assessment Marks: 60
Internal Assessment Marks: 15
Time: 3 Hours

Note: There shall be nine questions in all. The candidates have to attempt five questions including Question 1 which is compulsory comprising six short questions to be answered in 15-20 words each. In addition, the candidates have to attempt four more questions selecting at least one from each unit. All questions carry equal marks.

UNIT- I

1. Definition, nature and scope of Physical Geography.
2. Interior structure of the earth, geological time scale and rocks.

UNIT- II
3. Earth movements; orogenic and epeirogenic, earthquake and volcanoes.
4. Theory of Isostasy, Wegner's theory of continental drift and Plate tectonic theory.

UNIT- III
5. Weathering: causes and its types.
6. Mass-movements: causes, types and impacts.

UNIT- IV
7. Concept of cycle of erosion; cycle of erosion by W.M. Davis
8. Processes and land forms of Wind, River, Underground water, Glacier and Sea waves.

Suggested Readings

1. Sharma H.S. Perspective in Geomorphology, Concept, New Delhi 1980.
2. Singh Savinder, Geomorphology, Prayag Publication, Allahabad1998.
3. Singh Savinder, Physical Geography Prayag Publication, Allahabad,1998.
4. Sparks B.W. Geomorphology, Jojngman, London,1960.
5. Thornbury W.D. 1969 Principles of Geomorphology, New York, John Wiley &Sons.
6. Gautam, A (2010): Bhautik Bhugol, Rastogi Publications, Meerut.
7. Tikkaa, R.N. (1989): Bhautik Bhugol ka Swaroop, Kedarnath Ram Nath, Meerut.
8. Singh, S (2009) Bhautik Bhugol ka Swaroop, Prayag Pustak, Allahabad.

B.A. GEOGRAPHY - SECOND SEMESTER
REPRESENTATION OF PHYSICAL FEATURES (PRACTICAL)
UG - GEO 104

Distribution of Marks   **Maximum Marks: 25**
Exercises=15   **Time: 3 Hour**
Record File=05
Viva-voce=05

Note: There will be four questions in all and candidate has to attempt three exercises.

	Exercises

1. Introduction to Topographical Sheets — 5

   India and adjacent countries
   a. Degree Sheet
   b. Half Degree Sheet
   c. Quarter Degree Sheet
   d. Series of Scale
   e. Conventional Signs

2. Methods of representing relief — 1

3. Representation of Topographical features by contours. — 4

   Slopes (Concave, convex, undulating and terraced) Valleys (V Shaped, U shaped, Gorge, Re-entrant) Ridges (Conical hill, Volcanic hill, Plateau, Escarpment) Complex features (waterfall, sea cliff, overhanging cliff, Fiord coast)

4. Drawing of Profiles — 5
   a. Cross Profiles: Serial, superimposed, projected and composite profiles.
   b. Longitudinal Profiles

Suggested Readings

1. F.J. Monkhouse and H.R. Wilkinson (1972) Maps and Diagrams, Mothuen and Co. Ltd., London.
2. L.R. Singh and Raghuvander Singh (1973), Map Work and Practical Geography, Central Book Depot, Allahabad.
3. R.I. Singh and P.K. Dutt (1968), Elements of Practical Geography, Students Friends, Allahabad
4. Singh Gopal (2004) 4th edition, Map Work and Practical Geography, Vikas Publication House, New Delhi.

B.A. GEOGRAPHY (PASS COURSE) SECOND YEAR
(THIRD SEMESTER)

Learning Outcomes and Objectives:

1. To enable students to understand the atmospheric and hydrospheric components of the earth system;
2. To familiarize the students with the processes and dynamics of Oceanic circulation.

B.A. GEOGRAPHY (THIRD SEMESTER)
PHYSICAL GEOGRAPHY-II
UG – GEO 201

Maximum Marks: 75
External Assessment Marks: 60
Internal Assessment Marks: 15
Time: 3 Hours

Note: There shall be nine questions in all. The candidates have to attempt five questions including Question 1 which is compulsory comprising six short questions to be answered in 15-20 words each. In addition, the candidates have to attempt four more questions selecting at least one from each unit. All questions carry equal marks.

UNIT-I

1. Weather and climate; origin, composition and structure of atmosphere.
2. Insolation, global heat budget, horizontal and vertical distribution of temperature, inversion of temperature.

UNIT-II

3. Atmospheric pressure: measurement and distribution, pressure belts, planetary, seasonal and local winds.
4. Humidity: measurement and variables; evaporation and condensation, precipitation: forms, types and distribution; hydrological cycle.

UNIT-III

5. Air masses: concept and classification; fronts: type and characteristics.
6. Weather disturbances: tropical and extra-tropical cyclones.

UNIT-IV

7. Configuration of oceanic floor and bottom relief of Pacific and Atlantic oceans; temperature of oceans.
8. Oceanic currents; circulation in Pacific, Atlantic and Indian Oceans; Oceanic resources.

Suggested Readings
1.	Barry, RG and Chorley R.J., Atmosphere, Weather and Climate, Routledge,1998.
2.	Critchfield, H., General Climatology, Prentice-Hall of India,2002.
3.	King, C. Oceanography for Geographers, Edward Arnold, London,1975.
4.	Trewartha, GT: An Introduction to Climate, Mc-Graw Hill, New York,1981.
5.	Trewartha, G.T., The Earth's Problems Climates, University of Wisconsin Press, USA.
6.	Gupta L S (2000): Jalvayu Vigyan, Hindi Madhyam Karyanvay Nidishalya, DelhiVishwa Vidhyalaya, Delhi.
7.	Lal, D S (2006): Jalvayu Vigyan, Prayag Pustak Bhawan, Allahabad.
8.	Vatal, M (1986): Bhautik Bhugol, Central Book Depot, Allahabad.
9.	Singh, S (2009): Jalvayu Vigyan, Prayag Pustak Bhawan, Allahabad.

B.A. GEOGRAPHY (THIRD SEMESTER)
REPRESENTATION OF CLIMATIC DATA AND SURVEY (PRACTICAL)
UG - GEO 202

Distribution of Marks:	**Maximum Marks: 25**
Exercises=15	Time: 3 Hour
Record File=05	
Viva-voce=05	

Note: There will be four questions in all and candidate has to attempt three exercises.

1.	Measurement of temperature, rainfall, pressure and humidity.		
2.	Representation of temperature and rainfall.		
a.	Combined Line and Bar Graph	Exercise	1
b.	Distribution of temperature (Isotherms)	Exercise	1
c.	Distribution of rainfall (Isohytes)	Exercise	1
d.	Hythergraph	Exercise	1
e.	Rainfall deviation diagram	Exercise	1
3.	Climograph (wet and dry places) -	Exercise	2
4.	Distribution of pressure (Isobars) -	Exercise	2
5.	Weather map interpretation (January &July) -	Exercise	2
6.	Chain and tape survey	Exercise	2

Suggested Readings
1.	Mishra R.P. and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
2.	Monkhouse, FJ, and Wilkinson H.R., 1972. Maps and Diagrams, Methuen Press, London
3.	Robinson, A.H. et.al. Elements of Cartography, John Wiley &Sons,1995.
4.	Singh, R.L., 1979. Elements of Practical Geography, Kalyani Publisher, New Delhi.

B.A. GEOGRAPHY (PASS COURSE) FOURTH SEMESTER

Learning Outcomes and Objectives:

1.   To make the students familiar with the men- environment relation and human adaptation to the environment.
2.   The students will have the ability to understand the growth, distribution and composition of population in different parts of the world;
3.   Analyze the types and patterns of rural settlements in India and other regions of the world.

B.A. GEOGRAPHY (FOURTH SEMESTER)
HUMAN GEOGRAPHY
UG – GEO 203

Maximum Marks: 75
External Assessment Marks: 60
Internal Assessment Marks: 15
Time: 3 Hours

Note: There shall be nine questions in all. The candidates have to attempt five questions including Question- 1 which is compulsory comprising six short questions to be answered in 15-20 words each. In addition, the candidates have to attempt four more questions selecting at least one from each unit. All questions carry equal marks.

UNIT -I

1.   Nature and scope of human geography; branches of human geography; approaches to the study of human geography.
2.   Division of mankind: spatial distribution of tribes of India: Santhals, Gonds and Bhils.

UNIT - II
3.   Concept of man- environment relation: A historical approach.
4.   Human adaptation to the environment (i) cold region Eskimos (ii) Hot Region – Bushman.

UNIT - III

5.   Distribution, density and growth of world population.
6.   Population theories: Malthus and optimum population theory.

UNIT-IV
7.   Rural settlements: meaning, classification and types.
8.   Population pressure, resource use and environment degradation; concept of deforestation, air and water pollution.

Suggested Readings

1. Aggarwal, A: The Citizen's Fifth Citizen's Report, Centre for Science & Environment, New Delhi,1999.
2. Alexander, John. W.: Economic Geography, Prentice Hall of India Ltd., New Delhi, 1988.
3. Bergwan, Edward E: Human Geography: Culture Connections and Landscape, Prentice- Hall, New Jersey,1985.
4. Carr, M. Patterns: Process and Change in Human Geography, McMillan Education, London,1987.
5. Chandna, R.C.: A Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi,1986.
6. DeBlij, H. J.: Human Geography, Culture, Society and Space, John Wiley, New York, 1996.
7. Fellman, J.L.: Human Geography-Landscapes of Human Activities, Brown and Benchman Pub., USA,1997.
8. Global Environment Outlook: Earthscan, London,2000.
9. McBride, P.J. Human Geography; Systems Patterns and Change, Nelson, UK and Canada,1996.
10. Michael, Can: New Patterns: Process and Change in Human Geography, Nelson,1996.
11. Kaushik, S.D. (2010) Manav Bhugol, Rastogi Publication, Meerut.
12. Maurya, S.D. (2012) Manav Bhugol, Sharda Pustak Bhawan, Allahabad.
13. Hussin, Majid (2012) Manac Bhugol, Rawat Publications, Jaipur.

B.A. GEOGRAPHY (FOURTH SEMESTER)
MAP PROJECTIONS AND SURVEY (PRACTICAL)
UG - GEO 204

Distribution of Marks: **Maximum Marks: 25**
Exercises=15   **Maximum Time: 3 Hours**
Record File=05
Viva-voce=05

Note: There will be four questions in all and candidate has to attempt three exercises.

Total Exercises = 15

1. Introduction to Map Projection: Meaning, Classification and importance; Characteristics of lines of latitudes and longitudes.
2. Cylindrical projections: Characteristics, applications and drawing;   (3)
   a. Simple cylindrical projection
   b. Cylindrical equal area projection
   c. True shape or orthomorphic or Mercator's Projection   (5)
3. Conical Projections: Characteristics, applications and drawing
   a. Simple conical projections with one standard parallel
   b. Simple conical projection with two standard parallel
   c. Bonne's Projection
   d. Polyconic projection
   e. International Map Projection

4. Zenithal Projections: Characteristics, applications and drawing. (5)
   a. Polar Zenithal Equidistant Projection.
   b. Polar Zenithal Equal Area Projection
   c. Polar Zenithal Gnomonic Projection
   d. Polar Zenithal Stereographic Projection.
   e. Polar Zenithal Orthographic Projection

5.   Characteristics, drawing and   applications of
     a. Sinusoidal and (2)
     b. Mollweide Projections
6.   Plane Table Survey (2)

Suggested Readings

1.   Goyal K.K.1981. Practical Geography, Manthan Publication, Rohtak.
2.   GregoryS. 1963.Statistical Methodsand the Geography,Longman,London.
3.   Khan, A.A. 1996. Text Book of Practical Geography, Concept, NewDelhi,.
4.   Lawarence, GRP1968. Cartographic Methods, Methuen, London,
5.   Monkhouse, F.J. and Wilkinson, H.R1994. Maps and Diagrams, Methuen, London,
6.   Pal. S.K. 1998: Statistics for Geoscientist- Techniques and Applications, Concept Publication, New Delhi,.
7.   Sarkar, A.K 1997: Practical Geography-A Systematic Approach, Orient Longman, Calcutta,
8.   Singh,R.L.1972. Elements of Practical Geography,Kalyani Pub.,New Delhi
9.   Steers, J.B. Map Projections; University of London Press, London.

B.A. GEOGRAPHY (PASS COURSE) THIRD YEAR
(FIFTH SEMESTER)

Learning Outcomes and Objectives:

1. To introduce students to classification of economic activities and their impact on environment.
2. To impart knowledge about natural resources and importance of their utilization.
3. To acquaint students with understanding of the spatial distribution of crops, mineral resources and industries in the world.

B.A. GEOGRAPHY - FIFTH SEMESTER
ECONOMIC GEOGRAPHY
UG – GEO 301

Maximum Marks: 75
External Assessment Marks: 60
Internal Assessment Marks: 15
Time: 3 Hours

Note: There shall be nine questions in all. The candidates have to attempt five questions including Question -1 which is compulsory comprising six short questions to be answered in 15-20 words each. In addition, the candidates have to attempt four more questions selecting at least one from each unit. All questions carry equal marks.

UNIT- I

1. Definition, nature, scope of economic geography; it's relation with economics and other branches of social sciences.
2. Classification of economic activities and their impact on environment.

UNIT- II

3. World natural resources: types, bases and classification.
4. Conservation and utilization of natural resources.

UNIT- III

5. Spatial distribution of food (rice and wheat), commercial (cotton and sugarcane) and plantation crops (tea, rubber and coffee).
6. Classification of mineral resources (ferrous and non-ferrous); distribution and production of coal, iron ore, petroleum and natural gas.

UNIT- IV

7. Classification of industries; world distribution and production of iron and steel and textile industry, major industrial complexes of the world.
8. Transport, communication and trade: geographical factors in their development; major modes of water, land and air transport; recent trends in international trade

Suggested Readings

1.   Hartshorne T Nand Alexander JW. 1988. Economic Geography, Prentice Hall, New Delhi.
2.   Jones CF and Darkenwald GG. 1975. Economic Geography. McMillan Company, New York
3.   Thomas, RS. 1962. The Geography of Economic Activities. McGraw Hill, NewYork.
4.   Wheeler J et al. 1995. Economic Geography. John Wiley,New York.

B.A. GEOGRAPHY - FIFTH SEMESTER
DISTRIBUTION OF MAPS, DIAGRAMS AND SURVEY (PRACTICAL)
UG – GEO 302

Distribution of Marks: **Maximum Marks: 25**
Exercises=15   **Time: 3 Hour**
 Record File=05
 Viva-voce=05

Note: There will be four questions in all and candidate has to attempt three exercises.

1.   Principal of map design and layout
2.   Symbolization: point, line and area symbol
3.   Lettering and toponomy
4.   Mechanics of map construction
5.   Distribution maps
(i)   Qualitative distribution maps
●   Choroschematic maps- 1 Exercise
●   Chorochromatic maps- 2 Exercise
(ii)   Quantitative distribution Maps
●   Isopleth maps-3 exercise
●   Choropleth maps- 3 exercise
●   Dot Maps- 3 exercise
●   Diagrammatic Maps- 3 exercise
6.   Prismatic Compass Survey – 2 Exercises.

Suggested readings

1.   Mishra RP and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
2.   Monkhouse FJ and Wilkinson HR. 1972. Maps and Diagrams, Methuen Press, London
3.   Singh Gopal. 2004. Map Work and Practical Geography, Vikas Publication House, New Delhi.
4.   Singh RL. 1979. Elements of Practical Geography, Kalyani Publishers, New Delhi

B.A. GEOGRAPHY (PASS COURSE) SIXTH SEMESTER

Learning Outcomes and Objectives:

1. To provide knowledge of aerial photographs and their interpretation.
2. To familiarize students with the basics of Remote Sensing &GIS and their application.
3. To make the students familiar with basic statistical methods in geography.

B.A. GEOGRAPHY - SIXTH SEMESTER
INTRODUCTION TO REMOTE SENSING, GIS & QUANTITATIVE METHODS
UG – GEO 303

Maximum Marks: 75
External Assessment Marks: 60
Internal Assessment Marks: 15
Time: 3 Hours

Note: There shall be nine questions in all. The candidates have to attempt five questions including Question 1 which is compulsory comprising six short questions to be answered in 15-20 words each. In addition, the candidates have to attempt four more questions selecting at least one from each unit. All questions carry equal marks.

Unit-I
1. Introduction to aerial photographs: their types and advantages.
2. Elements of aerial photo interpretation.
Unit-II
3. Introduction to Remote Sensing; electromagnetic spectrum, stages in remote sensing, type of remote sensing, satellite orbits- geostationary and near polar.
4. Application of remote sensing in various fields such as agriculture, environment and resource mapping.
Unit-III
5. Introduction to Geographical Information System: definition, purpose, components and functions.
6. Application of GIS in various fields of geography.
Unit-IV
7. Measures of Central Tendency: Mean, Median and Mode.
8. Measure of Dispersion: Range, Quartile deviation and Mean deviation, Standard deviation, Coefficient of variation.

Suggested Readings

1. Aslam Mahmood 1993. Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi,
2. John R. Jensen 2009. Remote Sensing of the Environment; An Earth Resource Perspective, Pearson Education, (India Edition) New Delhi,
3. Kumar Meenakshi 2001. Remote Sensing, NCERT, New Delhi,
4. Lillesand and R.W. Kiefer,2005. Remote Sensing and Image Interpretation, John Wiley and Sons.
5. Pritvish Nag, and M. Kudrat 1998. Digital Remote Sensing, Concept Publishing Company, New Delhi,

B.A. GEOGRAPHY - SIXTH SEMESTER
INTRODUCTION TO REMOTE SENSING, GPS AND FIELD SURVEY REPORT
(PRACTICAL)
UG – GEO 304

Maximum Marks: 25
Time: 3 Hours

A. **Remote Sensing Practical – 15 Marks**

Marks Breakup:
Exercise = 09
Record book: 03
Viva-voce: 03

1. Demarcation of Principal Point, Conjugate Principal point and Flight line on Aerial Photographs - 3 exercise
2. Use of Stereoscope and Identification of Features- 2 exercise.
3. Identification of Features from satellite images- 2 exercises.
4. Mapping by GIS -2 exercises.

B. **Socio-economic Survey and Report Writing -10 marks.**

Marks Break up
Field Survey Report = 06 marks
Viva voce= 04 marks

Suggested Readings

1. John R. Jensen, Remote Sensing of the Environment; An Earth Resource Perspective, Pearson Education, (India Edition) New Delhi,2009.
2. Lillesand and R.W.Kiefer, Remote Sensing and Image Interpretation, John Wiley and Sons,1994.
3. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi.
4. Chauniyal, D.D. (2010) Sudur Samvedan evam Bhogolik Suchana Pranali,Sharda Pustak Bhawan, Allahabad.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

SCHEME OF B.A. Part-I (PASS COURSE)

POLITICAL SCIENCE

SEMESTER SYSTEM

B.A.Part –I w.e.f. session 2017-2018

Class	Nomenclature of Paper	Internal Assess.	Theory	Total Marks	Time
B.A. (Sem. I)	Option (i) Indian Constitution	20	80	100	3 Hrs.
-do-	Option (ii) International Relations-I	20	80	100	3 Hrs.
B.A. (Sem.II)	Option (i) Indian Politics	20	80	100	3 Hrs.
-do-	Option (ii) International Relations-II	20	80	100	3 Hrs.

B.A. Part - II w.e.f. session 2018-19

Class	Nomenclature of Paper	Internal Assess.	Theory	Total Marks	Time
B.A. (Sem. III)	Option (i) Principles of Political Sciences-I	20	80	100	3 Hrs.
-do-	Option (ii) Indian Political Thinker-I	20	80	100	3 Hrs.
B.A. (Sem.IV)	Option (i) Principles of Political Sciences-II	20	80	100	3 Hrs.
-do-	Option (ii) Indian Political Thinkers-II	20	80	100	3 Hrs.

B.A. Part -III w.e.f. session 2019-20

Class	Nomenclature of Paper	Internal Assess.	Theory	Total Marks	Time
B.A. (Sem. V)	Option (i) Comparative Politics	20	80	100	3 Hrs.
-do-	Option (ii) International Organization-I	20	80	100	3 Hrs.
B.A. (Sem.VI)	Option (i) Comparative Constitutions of UK & USA	20	80	100	3 Hrs.
-do-	Option (ii) International Organization-II	20	80	100	3 Hrs.

NOTE :- *The students are required to opt only one out of two Optional papers in each Semester.*

INDIRA GANDHI UNIVERSITY, MEEERPUR, REWARI

**B.A. Part-I, Political Science (Pass Course)
Semester-I**

NOTE: There will be two Optional papers. The students will have to opt only one paper out of the two papers. The maximum marks are 100. (Theory 80, Internal Assessment 20).

Option (i) : Indian Constitution

M. Marks: 80
Internal Assessment: 20
Time: 3 Hours

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit.   All questions will carry equal marks.

UNIT-I
Indian Constitution – Sources and Features, Preamble, Fundamental Rights, Fundamental Duties and Directive Principles of State Policy.

UNIT-II
Union and State Executive – President, Prime Minister, Council of Ministers; State Executive – Governor, Chief Minister and Council of Ministers.
UNIT-III
Union and State Legislature – Parliament-Composition and Functions; Speaker of Lok Sabha Amendment Process; State Legislature-Vidhan Sabha; Panchayati Raj

UNIT-IV
Judiciary – Supreme Court, High Courts, Judicial Review.

Reading:
1. G. Austin, The Indian Constitution: Corner Stone of a Nation, Oxford,
   Oxford University Press, 1966.
2. D.D. Basu, An Introduction to the Constitution of India, New Delhi, Prentice
   Hall, 1994.
3. D.D. Basu and B. Parekh (ed.), Crisis and Change in Contemporary India,
New Delhi,
   Sage, 1994.
4. C.P. Bhambhri, The Indian State: Fifty Years, New Delhi, Shipra,1997.
5. P. Brass, Politics of India Since Independence, Hyderabad, Orient Longman, 1990.
6. R. Kothari, Politics in India, New Delhi, Orient Longman, 1970.
7. W.H. Morris Jones, Government and Politics in India, Delhi, BL
Publications, 1974.
8. J.R. Siwach, Dynamics of Indian Government & Politics, New Delhi,
   Sterling Publishers, 1985.

INDIRA GANDHI UNIVERSITY, MEEERPUR, REWARI

B.A. Part-I, Political Science (Pass Course)
Semester-I

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (ii): International Relations-I

Max. Marks: 80
Internal Assessment: 20
Time: 3 Hrs.

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of eight short answer questions of 2 marks each.

Unit-I
Definition, Nature, Scope and Development of International Relations,
Autonomy Debate
regarding International Relations.

Unit-II
Approaches and Theories:-
a) Idealist Approach
b) Realist Approach
c) Systems Approach
d) Marxian Approach

Unit-III

National Power : Definition, Elements and Assessment, Limitations on
National Power:
International Law, International Morality and World Public Opinion

Unit-IV
Balance of Power, Collective, Security.

Readings
1. John, Baylis and Steve Smith, *Globalization of World Politics*, Oxford, London, 1997.
2. P.Allan and K. Goldman (eds.), *The End of the Cold War, Dordrecht*, Martinus Nijhoff,1992.
3. S. Burchill et. al., *Theories of International Relations*, Hamsphire, Macmillan, 2001.
4. S.H. Hoffman, *Essays in Theory and Politics of International Relations*, Boulder Colorado, Westview Press, 1989.
5. M.P. Sullivan, *Theories of International Politics: Enduring Paradigm in a Changing World*, Hamsphire, Macmillan, 2001.

INDIRA GANDHI UNIVERSITY, MEERPUR,REWARI
B.A. Part-I, Political Science (Pass Course)
Semester-II

Syllabi and Courses of Reading

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (i) : Indian Politics

M. Marks : 80
Internal Assessment : 20
Time : 3 Hours

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of eight short answer questions of 2 marks each.

UNIT-I

Federalism and its Working with reference to Centre-State Relations, Demand for State
Autonomy; Emerging Trends in Indian Federalism.

UNIT-II

Election Commission, Electoral Process and its Defects and Voting Behaviour, Electoral
Reforms, Problem of Defection.

UNIT-III
Party System in India: National and Regional Political Parties.

UNIT-IV
Role of Caste, Religion, Language, Regionalism in India, Politics of Reservation.
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Reading:
1. D.D. Basu and B. Parekh (ed.), Crisis and Change in Contemporary India, New Delhi, Sage, 1994.
2. P. Brass, Politics of India Since Independence, Hyderabad, Orient Longman, 1990.
3. S. Kaushik (ed.), Indian Government and Politics, Delhi University, Directorate of Hindi Implementation racy and Discontent: India's Growing Crisis ofGovernability, Cambridge, Cambridge University Press, 1991.
4. R. Kothari, Politics in India, New Delhi, Orient Longman, 1970.
5. R. Kothari, Party System and Election Studies, Bombay, Asia Publishing House, 1967.
6. J.R. Siwach, Dynamics of Indian Government & Politics, New Delhi, Sterling Publishers, 1985.
7. R. Thakur, The Government & Politics of India, London, Macmillan, 1995.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

B.A. Part-I, Political Science (Pass Course)

Semester-II

Syllabi and Courses of Reading

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

M. Marks: 80
Internal Assessment: 20
Time: 3 Hours

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of eight short answer questions of 2 marks each.

Option (ii): International Relations-II

Unit-I
Ideology in International Relations, National Interest, Foreign Policy, Diplomacy

Unit-II
Cold War, Non-Alignment, End of Cold War.

Unit-III

Meaning of Disarmament and Arms-control: Types of Disarmament; History of Disarmament: NPT, CTBT.

Unit-IV
New International Economic Order, North-South Dialogue, Globalization.

Readings
1. John, Baylis and Steve Smith, *Globalization of World Politics*, Oxford, London, 1997.
2. P.Allan and K. Goldman (eds.), *The End of the Cold War, Dordrecht*, Martinus Nijhoff, 1992.
3. S. Burchill et. al., *Theories of International Relations*, Hamsphire, Macmillan, 2001.
4. K.W. Deutsch, *The Analysis of International Relations*, New Delhi, Prentice Hall, 1989.
   asingstoke, Macmillan, 1999.
5. F. Halliday, *Rethinking International Relations*, Basingstoke, Macmillan, 1994.
7. M.S. Rajan, *Non-Alignment and the Non-Alignment Movement in the Present World Order*, Delhi, Konark, 1994.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

B.A. Part-II, Political Science (Pass Course)

Semester-III
Syllabi and Courses of Reading

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (i) : Principles of Political Science-I

Max. Marks : 80
Internal Assessment : 20
Time : 3 Hrs.

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of eight short answer questions of 2 marks each.

Unit-I
Political Science: Definition, Meaning, Nature and Scope.
Relations of Political Science with other Social Sciences.

Unit-II
State: Definition, Elements, Relations with the other organizations.
Theories of the Origin of the State.

Unit-III
Nature of State: Liberal, Marxian.
Functions of State: Liberal and Socialist Views.
Welfare State: Concept and Functions.

Unit-IV
Sovereignty: Definition, Attributes and Types.
Theories of Sovereignty: Monistic and Pluralistic.

Readings

1   The Dynamics of Diplomacy, Jean Robert Leguey- Feilleux, Published by (VIVA) Vinod Vasishtha for viva Books Private Ldt., 4732/23 Ansari Road, New Delhi-110002, Printed by Anand Sons, Delhi-100092, First Edition-2010.

2   The game of Diplomacy- Richard Sharp, Published in Great Britain by Arthur Barker Ltd. London, 1928

3   Diplomacy for the 21st Century, Naunihal Singh, Naurang Rai Mittal Publications (New Delhi) First Edition- 2002.

4   Conduct of the New Diplomacy: Jamesh Cany, Marper & Row, New York, Evanstom and London, Copy right-1964.

5   Modern Diplomacy: Pialecties and Pinensions, GVG Krishnanmurty, Marinder Sagar, Sagar Publications, New Delhi-110001, 1980.

6   Theory and Practice of Diplomacy: Dr. Harish Chander Sharma, College Book Depot, Jaipur, New Delhi.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

B.A. Part-II, Political Science (Pass Course)
Semester-III

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

(Option-ii) Indian Political Thinkers-I

Max. Marks : 80
Internal Assessment :

20
Time : 3 Hrs.

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of eight short answer questions of 2 marks each.

Unit-I
Raja Ram Mohan Ray and Swami Dayanand,
Unit-II
Dada Bhai Narojee and Gopal Krishan Gokhle

Unit-III
Swami Vivekanand and Aurbind Ghosh
Unit-IV
Lala Lajpat Rai and Bal Gangadhar Tilak

Readings
1. A.S. Altekar, *State and Government in Ancient India*, Delhi, Motilal Banarsidass, 1966.
2. A.Appadorai, *Documents on Political Thought in Modern India*, 2 Vols. Bombay Oxford University Pres, 1970.
3. S. Ghose, *Modern Indian Political Thought*, Delhi, Allied, 1984.
4. V.R. Mehta*, Foundations of Indian Political Thought*, New Delhi, Manohar, 1992.
5. T. Pantham, and K. Deustch (eds), *Political Thought in Modern India*, New Delhi, Sage, 1986.
6. B. Parekh and T. Pantham (eds), *Political Discourse: Exploration in Indian and Western Political Thought*, New Delhi, Sage, 1987.
7. V.R. Mehta, Foundations of Indian Political Thought, New Delhi, Manohar, 1992.

INDIRA GANDHI UNVIERSITY, MEEERPUR, REWARI

B.A. Part-II, Political Science (Pass Course)
Semester-IV

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (i) : Principles of Political Science-II

M. Marks : 80
Internal Assessment : 20
Time : 3 Hours

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of eight short answer questions of 2 marks each.

Unit-I

Concepts and Theories of Rights.
Relationships between Rights and duties.
Universal Declaration of Human Rights.

Unit-II

Concept and Theories of Liberty and Equality.
Relationship between Liberty and Equality.

Unit-III

Concepts of Social Change
Concept and Theories and Development.

Unit-IV

RTI and Consumer Protection and Welfare.

Readings

1   The Dynamics of Diplomacy, Jean Robert Leguey- Feilleux, Published by (VIVA) Vinod Vasishtha for viva Books Private Ldt., 4732/23 Ansari Road, New Delhi-110002, Printed by Anand Sons, Delhi-100092, First Edition-2010.

2   The game of Diplomacy- Richard Sharp, Published in Great Britain by Arthur Barker Ltd. London, 1928

3   Diplomacy for the 21st Century, Naunihal Singh, Naurang Rai Mittal Publications (New Delhi) First Edition- 2002.

4   Conduct of the New Diplomacy: Jamesh Cany, Marper & Row, New York, Evanstom and London, Copy right-1964.

5   Modern Diplomacy: Pialecties and Pinensions, GVG Krishnanmurty, Marinder Sagar, Sagar Publications, New Delhi-110001, 1980.

6   Theory and Practice of Diplomacy: Dr. Harish Chander Sharma, College Book Depot, Jaipur, New Delhi.

INDIRA GANDHI UNVIERSITY, MEEERPUR, REWARI

B.A. Part-II, Political Science (Pass Course)
Semester-IV

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (ii) : Indian Political Thinkers

Max. Marks : 80
Internal Assessment : 20
Time : 3 Hrs.

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of eight short answer questions of 2 marks each.

Unit-I
Mahatma Gandhi and M.N, Roy

Unit-II
Jawaharlal Nehru and B.R. Ambedkar

Unit-III
Subhash Chander Bose and Bhagat Singh

Unit-IV
J.P. Narayan and Ram Manohar Lohia

Readings
1. A.Appadorai, Indian Political Thinking Through the Ages, Delhi Khanna Publishers,
   1992.
2. K.P. Karunakaran, Indian Politics from Dababhai Naoroji to Gandhi : A Study of Political Ideas of Modern India, New Delhi, Gitanjali, 1975.
3. V.R.Mehta, Foundations of Indian Political Thought, New Delhi, Manohar, 1992.
4. V.P. Verma, Modern Indian Political Thought, Agra, Lakshmi Narain Aggarwal, 1974

INDIRA GANDHI UNIVERSITY, MEEERPUR, REWARI

B.A. Part-III, Political Science (Pass Course)
Semester-V

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (i): Comparative Politics

M. Marks: 80
Internal Assessment: 20
Time: 3 Hours

NOTE : Total 10 questions will be set: four each from Part A and Part B and the two from Part C. Candidates will have to attempt five questions in all selecting at least one question from each part. There will be one compulsory multiple choice objective type question.

UNIT-I
Comparative Politics-Definition, Scope; Traditional & Modern Concerns; Comparative Methods.

UNIT-II

Approaches to the Study of Comparative Politics: Input-Out (David Easton), Structural-Function (G. Almond), Political Development, Political Culture (G. Almond).

UNIT-III
Constitutionalism: History, Nature, Type and Problem in Modern Times.

UNIT-IV
Constitutional Structure: (a) Formal-Executive, Legislation and Judiciary, (b) Informal Structures– Political Parties and Pressure Groups.

Readings
1.   G.A. Almond and J.S. Coleman, The Politics of the Developing Areas, Princeton NJ, Princeton University Press, 1960.
2.   G.A. Almond, and S. Verba, The Civic Culture : Political Attitudes and Democracy in Five Nations, Princeton NJ, Princeton University Press, 1963.
3.   L.J.Cantori and A.H. Zeigler (ed.), Comparative Politics in the Post-Behaviouralist Era, London, Lynne Reinner Publisher, 1988.

4.   O. Dunleavy and B.O' Leary, Theories of Liberal Democratic State, London, Macmillan, 1987.
5.   R. Hauge and M. Harrop, Comparative Government and Politics. An Introduction, 5th edn., New York, Palgrave, 1001.
6.   H. Finer, Theory and Practice of Modern Government, London, Methuen, 1969.
7.   J.C. Johari, Comparative Political Theory: New Dimensions, Basic Concepts and Major Trends, New Delhi, Sterling, 1987.
8.   K. Kumar, Revolution : The Theory and Practice of a European Idea, London, Weidenfeld and Nicolson, 1971.
9.   R.C. Macridis, The Study of Comparative Government, New York, Doubleday, 1955.
10.   R.C. Macridis and R.E. Ward, Modern Political Systems : Europe, and Asia, 2nd edn. Englewood Cliffs NJ, Prentice Hall, 1968.
11.   J. Manor (ed.), Rethinking Third World Politics, London, Longman, 1991.
12.   R.C. Macridis, Modern European Governments : Cases in Comparative Policy - Making, Englewood Cliffs NJ, Prentice Hall, 1968.
13.   L.W. Pey (ed.), Communication and Political Development, Princeton NJ, Princeton University Press, 1963.
14.   R.I. Rotberg (ed.), Politics and Political Change : A Journal of Inter-Disciplinary History Reader, Massachusetts, MIT Press, 1001.
15.   H.J. Wiarda (ed.), New Developments in Comparative Politics, Boulder Colorado, Westview Press, 1986.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

B.A. Part-III, Political Science (Pass Course)
Semester-V

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (ii) : International Organization-I

Max. Marks: 80
Internal Assessment: 20
Time: 3 Hrs.

Note: Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of nine short answer questions of 2 marks each.

Unit-I
International Organization: Meaning, Nature and Scope.
Evolution and growth of International Organization.
Unit-II
League of Nations, Structure, Objectives, Functions and Causes of Failure.
Unit-III
U.N.O.: Origins, Objectives and Principles, Membership, Structure and Functions.
Organs of United Nations: General Assembly, Security Councils, Economic and Social Council,
U.N. Secretariat, International Court of Justice
Unit: IV
Specialized Agencies of the United Nations: UNESCO, IMF, ILO, UNICEF, WHO.

Readings:
1. E. Laurd, A History of the United Nations, London, Macmillan, 1989.
2. W.H. Lewis (ed.), The Security Role of the United Nations, New York, Praegar, 1991.
3. P. Baehr and L. Gordenker, The United Nations in the 1990s, London, Oxford University Press, 1992.
4. K. P. Saxena, Reforming the United Nations : The Challenge and Relevance, New Delhi, Sage, 1993.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

B.A. Part-III, Political Science (Pass Course)
Semester-VI

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (i) : Comparative Constitutions of UK & USA

M. Marks : 80
Internal Assessment : 20
Time : 3 Hours

NOTE : Total 10 questions will be set: four each from Part A and Part B and the two from Part C. Candidates will have to attempt five questions in all selecting at least one question from each part. There will be one compulsory multiple choice objective type question.

UNIT-I
Evolution, Conventions, Legacies and Basic features of Constitutions of UK & USA; Socio-Economic basis of Constitutions of UK & USA.

UNIT-II
Comparative Study of Executive, Legislature

UNIT-III
Comparative study of Judiciary of U.K. & U.S.A.
Comparative studies of Structures, Functions and roles of political parties and pressure groups of UK & USA.

UNIT-IV
Electoral Processes, Voting Behaviour, Bureaucracy of UK & USA.

Readings
1.   G. Almond et al., *Comparative Politics Today : A World View*, 7th edn., New York, London, Harper/Collins, 1000.
2.   W. Bagehot, *The English Constitution*, London, Fontana, 1963.
3.   J. Blondel, *An Introduction to Comparative Government*, London, Weidenfeld and Nicolson, 1969.
4.   E.S. Griffith, *The American System of Government*, 6th edn., London,   ethuen, 1983.
5.   A.Lijphart,(ed.), *Parliamentary versus Presidential Government*, Oxford and New York, Oxford University Press, 1992.
6.   M. Rhodes, P. Heywood and V. Wright, *Developments in West European Politics*, Basingstoke, Macmillan, 1997.
7.   J. Wilson, *American Government*, 4th edn., Boston Massachusetts, Houghton Miffin, 1997.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

B.A. Part-III, Political Science (Pass Course)
Semester-VI

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (ii) : International Organization-II

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of nine short answer questions of 2 marks each.

Unit-I
Regional Organizations, European Community, SAARC, ASEAN
Unit-II
UN and Social Justice: Human Rights, Decolonization.
Unit-III
Working of the U.N. towards Peace : Peace Making, Peace, Enforcement, Peace building and Peace Keeping, An Assessment of U.N.
Unit: IV
UN and the Third World; Reforms and Democratization of U.N. System, India's claim for Permanent Membership of the Security Council.
Readings
1. Richard K. Ashley, "The Eye of Power : The Politics of World Modelling," International Organization, Vol. 37, No. 3, 1983.
2. E. Laurd, A History of the United Nations, London, Macmillan, 1989.
3. W.H. Lewis (ed.), The Security Role of the United Nations, New York, Praegar, 1991.
4. P. Baehr and L. Gordenker, The United Nations in the 1990s, London, Oxford University Press, 1992.
5. Rikhey, Strengthening UN Peace keeping, London, Hurst and Co., 1993.
6. K. P. Saxena, Reforming the United Nations : The Challenge and Relevance, New Delhi, Sage, 1993.

Scheme of B.A. (Economics)

1st Year

Semester-I

	Max. Marks	Internal Assessment
Paper-I Microeconomics-I	80	20

Semester-II

	Max. Marks	Internal Assessment
Paper-IMicroeconomics-II	80	20

B.A. (ECONOMICS)
Semester-I
PAPER 1 : Microeconomics – I

Max. Marks: 80
Internal Assessment: 20
Time: 3 Hrs.

Unit-I

The Economic Problem: Scarcity and Choice, Functions of an Economic System, Circular Flow of Economic Activities, System of Economic Organization, Micro and Macro Economics, Law of Demand, Elasticity of Demand: concept, types, measurement, determinants and importance.

Unit -II

Consumer Theory: Concept of utility, Cardinal utility analysis, marginal and total utility, consumer's equilibrium, Derivation of demand curve, consumer's surplus.

Ordinal Utility Theory: Indifference curves analysis, characteristics, budget line, marginal rate of substitution, Consumer's Equilibrium, Price, income and substitution effects, Derivation of demand curve, Limitations of utility theory of demand.

Unit- III

Producer's behaviour and Supply: Supply, Firm as an agent of production, Law of variable proportions, Returns to scale, characteristics of Iso-quants, Ridge lines, least cost combination of factors, Internal and external economies and diseconomies. Movements and shifts in supply curve, Elasticity of supply.

Unit - IV

Cost Analysis: Concepts of costs, short period costs and long period costs, Modern Theory of costs,

Revenue: Concepts of revenue; total, average and marginal revenue and their relationships, Break-even-analysis & its uses

Note: -

The question paper will consist of 9 questions. The candidate will be asked to attempt 5 questions in all selecting one question from each unit. Question 9 shall be compulsory consisting of short answer type nine questions of two marks each and spread over the entire syllabus. All questions will carry equal marks.

Books recommended:

1.   Paul Samuelson and Nordhaus: Economics, Tata Mcgraw Hill Publishng Compnay, New Delhi.
2.   N. Gregory Mankiw: Principles of Economics, Thomson.
3.   J.E. Stiglitz and G.E. Walsh: Principles of Economics, W.W. Norton & Co. N.Y.
4.   R.G. Lipsey, and KA. Chrystal, Principles of Economics Oxford University Press, Oxford.
5.   A. Kousioyionnis , Modern Microeconomics, Macmillan.
6.   R.G. Lipsey and KA. Chrystal, Economics, Oxford University Press, Oxford.

B.A. (ECONOMICS)
Semester-II
PAPER 1 : Microeconomics – II

Max. Marks: 80
Internal Assessment: 20
Time: 3 Hrs.

Unit – I

Market Structures, Perfect Competition: Characteristics and assumptions, Price determination under perfect competition, Equilibrium of the firm and industry in the short period and the long period.

Monopoly: Characteristics, Equilibrium of the monopoly firm in short period and long period, Concept of supply-curve under monopoly, Price discrimination, Measure of monopoly power.

Unit-II

Imperfect Market: Monopolistic competition, characteristics, short period and long period equilibrium of the firm, Group-equilibrium, selling costs, product differentiation, excess capacity. Oligopoly: Characteristics, emergence of oligopoly, cournot's model, Bertrand's model, Price rigidity, Price leadership, Collusive and non-collusive oligopoly.
Unit-III

Market failure: Market efficiency, Reasons for Market failure, Public goods and externalities, transaction costs, asymmetric information, public policy towards monopoly and competition.

Unit-IV

Theory of factor pricing: Marginal productivity theory of distribution, Backward bending supply curve of labour, Ricardian and modern theory of rent, quasi-rent, net and gross interest, theories of interest, net and gross profit, theories of profit.

Note: -

The question paper will consist of 9 questions. The candidate will be asked to attempt 5 questions in all selecting one question from each unit. Question 9 shall be compulsory consisting of short answer type nine questions of two marks each and spread over the entire syllabus. All questions will carry equal marks.

Books recommended:

1.   Paul Samuelson and Nordhaus: Economics), Tata Mcgraw Hill Publishng Compnay, New Delhi.
2.   N. Gregory Mankiw: Principles of Economics, Thomson.
3.   J.E. Stiglitz and G.E. Walsh: Principles of Economics, W.W. Norton & Co. N.Y.
4.   R.G. Lipsey, and KA. Chrystal, Principles of Economics Oxford University Press, Oxford.
5.   A. Kousioyionnis , Modern Microeconomics, Macmillan.
6.   R.G. Lipsey and KA. Chrystal, Economics, Oxford University Press, Oxford.

Note: -

The question paper will consist of 9 questions. The candidate will be asked to attempt 5 questions in all selecting one question from each unit. Question 9 shall be compulsory consisting of short answer type nine questions of two marks each and spread over the entire syllabus. All questions will carry equal marks.

B.A. – II

Semester-III   Macroeconomics-I

Semester-IV   Macroeconomics-II

B.A.-III

Semester-V   Development Economics with one unit of Indian Economy -I

Semester-VI   International Trade and Finance with one unit of Indian Economy - II

<u>**B.A. – II (ECONOMICS)**</u>
<u>**SEMESTER- III**</u>

Macroeconomics-I

Max. Marks: 80
Internal Assessment: 20
Time: 3 Hrs.

Unit-I
Introduction to Macroeconomics and National Income Accounting
Macroeconomics: Nature and Scope; Macroeconomic Issues in an Economy. Concepts of GDP and National Income; Measurement of National Income and Related Aggregates; Nominal and Real Income; Limitations of the GDP concept. Methods of measurement of India's National Income by CSO.

Unit-II

National Income Determination
Actual and potential GDP; Aggregate Expenditure –Consumption Function , Investment Function; Equilibrium GDP; Concepts of MPC , APC, MPS, APS. Autonomous Expenditure; The Concept of Multiplier.

Unit-III

National Income Determination in an Open Economy with Government
Fiscal Policy - Impact of Changes in Govt.Expenditure and Taxes; Net Export Function; Net Exports and Equilibrium GDP.

Unit-IV

GDP and Price Level in Short and Long Run
Aggregate Demand and Aggregate Supply; Multiplier Analysis with AD curve and Price level Changes; Aggregate Supply in Short Run and Long Run.

Reference:
1. R.G.Lipsey and K.A.Chrystal: Principles of Economics (Latest Edition) (Oxford University Press).
2. *Joseph E. Stiglitz and Carl E. Walsh Principles of Macroeconomics, W.W. Norton & Company, Inc., New York, N.Y.*
3. *Paul A. Samuelson and William D. Nordhans (Indian Adoptation by Sudip Choudhary and Anindya Sen) : Economics, Tata Mcgraw Hill, New Delhi*
4. *N. Gregorgy Mankin: Principles of Macro Economics, Cengage Learning India Pvt. Ltd. New Delhi.*
5. *Ackley, G (1978), Macroeconomics: Theory and Policy, Macmillan, New York.*
6. *Banson, W.a. (1989), Macroeconomic Theory and Policy (3rd Ed.), Harper & Row, New York.*
7. *Shapiro, E (1996), Macroeconomic Analysis Galgotia Publication, New Delhi.*

Max. Marks: 80
Internal Assessment: 20
Time: 3 Hrs.

Money in a Modern Economy
Concept of Money in a Modern Economy; Monetary Aggregates; Demand for Money; Quantity Theory of Money; Liquidity Preference and Rate of Interest; Money Supply, Credit Creation and Monetary Policy.

Unit- II

IS-LM Analysis, Trade Cycle Theory and Growth Theory
Derivation of IS and LM Functions; IS-LM and Aggregate Demand; Shifts in AD Curve. Theories of Trade cycles: Samulson and Hicks models, Harrod and Domar growth model.

Unit- III

Balance of Payments and Exchange Rate
Gains from International Trade, Balance of Payments; Market for Foreign Exchange; Determination of Exchange Rates.

Unit- IV

Public Finance

Nature and Scope of Public Finance, Principle of Maximum Social Advantage, Effects of Public Expenditure, Impact and Incidence of taxes, Characteristics of a Good Taxation System.

Reference:
1. R.G.Lipsey and K.A.Chrystal: Principles of Economics (Latest Edition) (Oxford University Press).
2. Joseph E. Stiglitz and Carl E. Walsh Principles of Macroeconomics, W.W. Norton & Company, Inc., New York, N.Y.
3. Paul A. Samuelson and William D. Nordhans (Indian Adoptation by Sudip Choudhary and Anindya Sen) : Economics, Tata Mcgraw Hill, New Delhi
4. N. Gregorgy Mankin: Principles of Macro Economics, Cengage Learning India Pvt. Ltd. New Delhi.
5. Ackley, G (1978), Macroeconomics: Theory and Policy, Macmillan, New York.
6. Banson, W.a. (1989), Macroeconomic Theory and Policy (3rd Ed.), Harper & Row, New York.
7. Shapiro, E (1996), Macroeconomic Analysis Galgotia Publication, New Delhi.

3rd Year

Semester-V   **Development Economics   Max. Marks: 80 Internal Assessment: 20**

Semester-VI   **International Economics   Max. Marks: 80 Internal Assessment: 20**

BA (Economics) Pass Course
2013-14
Semester V
Development Economics

Max. Marks: 80
Internal Assessment: 20
Time: 3 Hrs.

Unit –I

Features of U.D.C's, Economic Growth and Development; Determinants, Measurement and obstacles of Economic Development, Vicious Circle of Poverty.

Unit-II

Balanced and Unbalanced Growth Theories, Lewis' Model and Leibenstein's Critical minimum effort thesis.

Unit III

Environment, Meaning, features and components of Environment.Scope of Environmental Economics; Environment as a necessity and luxury.Population-Environment linkage.Features of Environment as a public good.

Unit IV

Natural Resources; Environmental pollution, types, causes and effects. Control policies; Environmental legislations in India. Sustainable Development: meaning; indicators, measurement and importance of Sustainable Development.

Note:-

The question paper will consist of 9 questions. The candidate will be asked to attempt 5 questions in all, selecting one question from each unit. Question 9 shall be compulsory consisting of short answer type nine questions of two marks each and spread over the entire syllabus. All questions will carry equal marks.

Book recommended:

1. G. Meir and James E. Rauch (2000), "Leading Issues in Economic Development," Oxford University Press, New York.
2. Goodstein, E.S. (2002), "Economics and the Environment, 3rd edition, Prentice Hall.
3. Sinha
4. S.K. Mishra and V.K. Puri ,"Indian Economy", Himalaya Publishing House, New Delhi.
5. Ray, Debraj (2004), "Development Economics," Oxford University Press, New Delhi.
6. Ghatak, Subrata (2003), Introduction to Development Economics, Routledge, London, New York.
7. Thirwall, A. P. (2003), "Growth and Development," 7th ed. Palgrave Macmillan, New York.

BA (Economics) Pass Course
2013-14
Semester VI
International Economics

Max. Marks: 80
Internal Assessment: 20
Time: 3 Hrs.

Unit-I

Inter-regional and International Trade; Comparative Cost Theory; Hecksher-Ohlin Theory; Rate of Exchange Determination; Mint Par Theory and Purchasing Power Parity Theory

Unit-II

Fixed and Flexible Exchange Rate; Exchange Rate Policy in India.Free Trade Vs Protection; Terms of Trade, Exchange Control.

Unit-III

Change in Value, Volume, Composition and direction of Foreign Trade in India since 1991; Balance of Trade and Balance of Payments Structure, causes of adverse Balance of Payment in India and measure to correct it. Foreign Trade Multiplier.

Unit-IV

Objectives, Functions and advantages for India of International Monetary Fund; World Bank; World Trade Organisation andSouth Asian Association for Regional Cooperation PreferentialTrading Arrangement (SAPTA).

Note:-

The question paper will consist of 9 questions. The candidate will be asked to attempt 5 questions in all selecting one question from each unit. Question 9 shall be compulsory consisting of short answer type nine questions of two marks each and spread over the entire syllabus. All questions will carry equal marks.

Book recommended:

1. Bo-Soderston,"International Economics", Macmillan Press, London.
2. AlokGhosh, "Indian Economy", World Press, Calcutta.
3. A.N. Aggarwal,"Indian Economy", Vikas Publication, New Delhi.
4. RuddraDutta and KPM Sundram, "Indian Economy", S.Chand Publication, New Delhi.
5. S.K. Misra and V.K.Puri, "Indian Economy", Himalaya Publishing House, New Delhi.

NEW SCHEME

Scheme of Examination of B.A. 1st Semester Mathematics
(w.e.f. 2018-2019)

Paper Code	Title of the Paper	Allocation of Periods	Maximum Marks		
			Theory	Internal Assessment	Total
BM 111	Algebra	6 periods/ 4 hours per week	27	6	100
BM 112	Calculus	6 periods/ 4 hours per week	27	7	
BM 113	Solid Geometry	6 periods/ 4 hours per week	26	7	

 Note:- The other conditions will remain the same as per relevant ordinance and rules and regulations of the University.

(w.e.f. 2018-19)

<u>Algebra</u>

Paper: BM 111

Max. Marks:

4.5 x 4 = 18
1.5 x 6 = 9
Total = 27

Time: 3 Hours

<u>Note:</u> The question paper will consist of **five** sections. Each of the first four sections(***I-IV***) will contain two questions(each carrying 4.5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 1.5 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I

Symmetric, Skew symmetric, Hermitian and skew Hermitian matrices. Elementary Operations on matrices. Rank of a matrices. Inverse of a matrix. Linear dependence and independence of rows and columns of matrices. Row rank and column rank of a matrix. Eigenvalues, eigenvectors and the characteristic equation of a matrix. Minimal polynomial of a matrix. Cayley Hamilton theorem and its use in finding the inverse of a matrix.

Section – II

Applications of matrices to a system of linear (both homogeneous and non–homogeneous) equations. Theorems on consistency of a system of linear equations. Unitary and Orthogonal Matrices, Bilinear and Quadratic forms.

Section – III

Relations between the roots and coefficients of general polynomial equation in one variable. Solutions of polynomial equations having conditions on roots. Common roots and multiple roots. Transformation of equations.

Section – IV :

Nature of the roots of an equation Descarte's rule of signs. Solutions of cubic equations (Cardon's method). Biquadratic equations and their solutions.

Books Recommended :

1.   H.S. Hall and S.R. Knight : Higher Algebra, H.M. Publications 1994.

2.   Shanti Narayan : A Text Books of Matrices.

3.   Chandrika Prasad : Text Book on Algebra and Theory of Equations.

Pothishala Private Ltd., Allahabad.

(w.e.f. 2018-19)
Calculus

Paper: BM 112   **Max. Marks:**

4.5 x 4 = 18
1.5 x 6 = 9
Total = 27

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections (*I-IV*) will contain two questions (each carrying 4.5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 1.5 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Definition of the limit of a function. Basic properties of limits, Continuous functions and classification of discontinuities. Differentiability. Successive differentiation. Leibnitz theorem. Maclaurin and Taylor series expansions.

Section – II
Asymptotes in Cartesian coordinates, intersection of curve and its asymptotes, asymptotes in polar coordinates. Curvature, radius of curvature for Cartesian curves, parametric curves, polar curves. Newton's method. Radius of curvature for pedal curves. Tangential polar equations. Centre of curvature. Circle of curvature. Chord of curvature, evolutes. Tests for concavity and convexity. Points of inflexion. Multiple points. Cusps, nodes & conjugate points. Type of cusps.

Section – III :
Tracing of curves in Cartesian, parametric and polar co-ordinates. Reduction formulae. Rectification, intrinsic equations of curve.

Section – IV :
Quardrature (area)Sectorial area. Area bounded by closed curves. Volumes and surfaces of solids of revolution. Theorems of Pappu's and Guilden.

Books Recommended :

1.   Differential and Integral Calculus : Shanti Narayan.

2.   Murray R. Spiegel : Theory and Problems of Advanced Calculus. Schaun's Outline series. Schaum Publishing Co., New York.

3.   N. Piskunov : Differential and integral Calculus. Peace Publishers, Moscow.

4.   Gorakh Prasad : Differential Calculus. Pothishasla Pvt. Ltd., Allahabad.

5.   Gorakh Prasad : Integral Calculus. Pothishala Pvt. Ltd., Allahabad.

(w.e.f. 2018-19)

Solid Geometry

Paper: BM 113   **Max. Marks:**

5 x 4 = 20
1 x 6 = 6
Total = 26

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections (*I-IV*) will contain two questions (each carrying 5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 1 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I :
General equation of second degree. Tracing of conics. Tangent at any point to the conic, chord of contact, pole of line to the conic, director circle of conic. System of conics. Confocal conics. Polar equation of a conic, tangent and normal to the conic.

Section – II :
Sphere: Plane section of a sphere. Sphere through a given circle. Intersection of two spheres, radical plane of two spheres. Co-oxal system of spheres
Cones. Right circular cone, enveloping cone and reciprocal cone.
Cylinder: Right circular cylinder and enveloping cylinder.

Section – III :
Central Conicoids: Equation of tangent plane. Director sphere. Normal to the conicoids. Polar plane of a point. Enveloping cone of a coincoid. Enveloping cylinder of a coincoid.

Section – IV :
Paraboloids: Circular section, Plane sections of conicoids.
Generating lines. Confocal conicoid. Reduction of second degree equations.

Books Recommended

1.   R.J.T. Bill, Elementary Treatise on Coordinary Geometry of Three Dimensions, MacMillan India Ltd. 1994.
2.   P.K. Jain and Khalil Ahmad : A Textbook of Analytical Geometry of Three Dimensions, Wiley Eastern Ltd. 1999.

NEW SCHEME

Scheme of Examination of B.A. 2ⁿᵈ Semester Mathematics (w.e.f. 2018-2019)

Paper Code	Title of the Paper	Allocation of Periods	Maximum Marks		
			Theory	Internal Assessment	Total
BM 121	Number Theory and Trigonometry	6 periods/ 4 hours per week	27	6	
BM 122	Ordinary Differential Equations	6 periods/ 4 hours per week	27	7	100
BM 123	Vector Calculus	6 periods/ 4 hours per week	26	7	

Note:- The other conditions will remain the same as per relevant ordinance and rules and regulations of the University.

(w.e.f. 2018-19)

Number Theory and Trigonometry

Paper: BM 121   **Max. Marks:**

4.5 x 4 = 18
1.5 x 6 = 9
Total = 27

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 4.5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 1.5 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I :

Divisibility, G.C.D.(greatest common divisors), L.C.M.(least common multiple)
Primes, Fundamental Theorem of Arithemetic. Linear Congruences, Fermat's theorem. Wilson's theorem and its converse. Linear Diophanatine equations in two variables

Section – II :

Complete residue system and reduced residue system modulo m. Euler's ø function Euler's generalization of Fermat's theorem. Chinese Remainder Theorem. Quadratic residues. Legendre symbols. Lemma of Gauss; Gauss reciprocity law. Greatest integer function [x]. The number of divisors and the sum of divisors of a natural number n (The functions d(n) and σ(n)). Moebius function and Moebius inversion formula.

Section - III :

De Moivre's Theorem and its Applications. Expansion of trigonometrical functions. Direct circular and hyperbolic functions and their properties.

Section – IV :

Inverse circular and hyperbolic functions and their properties. Logarithm of a complex quantity. Gregory's series. Summation of Trigonometry series.

Books Recommended :

1. S.L. Loney : Plane Trigonometry Part – II, Macmillan and Company, London.
2. R.S. Verma and K.S. Sukla : Text Book on Trigonometry, Pothishala Pvt. Ltd. Allahabad.
3. Ivan Ninen and H.S. Zuckerman. An Introduction to the Theory of Numbers.

(w.e.f. 2018-19)

Ordinary Differential Equations

Paper: BM 122   **Max. Marks:**

| 4.5 x 4 = 18 |
| 1.5 x 6 = 9 |
| Total = 27 |

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 4.5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 1.5 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I :
Geometrical meaning of a differential equation. Exact differential equations, integrating factors. First order higher degree equations solvable for x,y,p Lagrange's equations, Clairaut's equations. Equation reducible to Clairaut's form. Singular solutions.

Section – II :
Orthogonal trajectories: in Cartesian coordinates and polar coordinates. Self orthogonal family of curves.. Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations. Equations reducible to homogeneous linear ordinary differential equations.

Section – III :
Linear differential equations of second order: Reduction to normal form. Transformation of the equation by changing the dependent variable/ the independent variable. Solution by operators of non-homogeneous linear differential equations. Reduction of order of a differential equation. Method of variations of parameters. Method of undetermined coefficients.

Section – IV :
Ordinary simultaneous differential equations. Solution of simultaneous differential equations involving operators x (d/dx) or t (d/dt) etc. Simultaneous equation of the form $dx/P = dy/Q = dz/R$. Total differential equations. Condition for $Pdx + Qdy + Rdz = 0$ to be exact. General method of solving $Pdx + Qdy + Rdz = 0$ by taking one variable constant. Method of auxiliary equations.

Books Recommended :

1. D.A. Murray : Introductory Course in Differential Equations. Orient Longaman (India) . 1967
2. A.R.Forsyth : A Treatise on Differential Equations, Machmillan and Co. Ltd. London
3. E.A. Codington : Introduction to Differential Equations.
4. S.L.Ross: Differential Equations, John Wiley & Sons
5. B.Rai & D.P. Chaudhary : Ordinary Differential Equations; Narosa, Publishing House Pvt. Ltd.

(w.e.f. 2018-19)

Vector Calculus

Paper: BM 123   Max. Marks:

5 x 4 = 20
1 x 6 = 6
Total = 26

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections (**I-IV**) will contain two questions (each carrying 5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 1 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Scalar and vector product of three vectors, product of four vectors. Reciprocal vectors. Vector differentiation. Scalar Valued point functions, vector valued point functions, derivative along a curve, directional derivatives

Section – II

Gradient of a scalar point function, geometrical interpretation of grad Φ , character of gradient as a point function. Divergence and curl of vector point function, characters of Div $\vec{f}$ and Curl $\vec{f}$ as point function, examples. Gradient, divergence and curl of sums and product and their related vector identities. Laplacian operator.

Section – III
Orthogonal curvilinear coordinates Conditions for orthogonality fundamental triad of mutually orthogonal unit vectors. Gradient, Divergence, Curl and Laplacian operators in terms of orthogonal curvilinear coordinates, Cylindrical co-ordinates and Spherical co-ordinates.

Section – IV

Vector integration; Line integral, Surface integral, Volume integral.
Theorems of Gauss, Green & Stokes and problems based on these theorms.

Books Recommended:

1.   Murrary R. Spiegal : Theory and Problems of Advanced Calculus, Schaum Publishing Company, New York.
2.   Murrary R. Spiegal : Vector Analysis, Schaum Publisghing Company, New York.
3.   N. Saran and S.N. NIgam. Introduction to Vector Analysis, Pothishala Pvt. Ltd., Allahabad.
4.   Shanti Narayna : A Text Book of Vector Calculus. S. Chand & Co., New Delhi.

<u>NEW SCHEME</u>

Scheme of Examination of B.A. 3rd Semester Mathematics
(w.e.f. 2018-2019)

Paper Code	Title of the Paper	Allocation of Periods	Maximum Marks		
			Theory	Internal Assessment	Total
BM 231	Advanced Calculus	6 periods/ 4 hours per week	27	6	
BM 232	Partial Differential Equations	6 periods/ 4 hours per week	27	7	100
BM 233	Statics	6 periods/ 4 hours per week	26	7	

Note:- The other conditions will remain the same as per relevant ordinance and rules and regulations of the University.

(w.e.f. 2018-19)

Advanced Calculus

Paper: BM 231

Max. Marks:

4.5 x 4 = 18
1.5 x 6 = 9
Total = 27

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 4.5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 1.5 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Continuity, Sequential Continuity, properties of continuous functions, Uniform continuity, chain rule of differentiability. Mean value theorems; Rolle's Theorem and Lagrange's mean value theorem and their geometrical interpretations. Taylor's Theorem with various forms of remainders, Darboux intermediate value theorem for derivatives, Indeterminate forms.

Section – II
Limit and continuity of real valued functions of two variables. Partial differentiation. Total Differentials; Composite functions & implicit functions. Change of variables. Homogenous functions & Euler's theorem on homogeneous functions. Taylor's theorem for functions of two variables.

Section – III
Differentiability of real valued functions of two variables. Schwarz and Young's theorem. Implicit function theorem. Maxima, Minima and saddle points of two variables. Lagrange's method of multipliers.

Section – IV
Curves: Tangents, Principal normals, Binormals, Serret-Frenet formulae. Locus of the centre of curvature, Spherical curvature, Locus of centre of Spherical curvature, Involutes, evolutes, Bertrand Curves. Surfaces: Tangent planes, one parameter family of surfaces, Envelopes.

Books Recommended:
1. C.E. Weatherburn : Differential Geometry of three dimensions, Radhe Publishing House, Calcutta
2. Gabriel Klaumber : Mathematical analysis, Mrcel Dekkar, Inc., New York, 1975
3. R.R. Goldberg : Real Analysis, Oxford & I.B.H. Publishing Co., New Delhi, 1970
4. Gorakh Prasad : Differential Calculus, Pothishala Pvt. Ltd., Allahabad
5. S.C. Malik : Mathematical Analysis, Wiley Eastern Ltd., Allahabad.
6. Shanti Narayan : A Course in Mathemtical Analysis, S.Chand and company, New Delhi
7. Murray, R. Spiegel : Theory and Problems of Advanced Calculus, Schaum Publishing co., New York

(w.e.f. 2018-19)
Partial Differential Equations

Paper: BM 232

Max. Marks:

4.5 x 4 = 18
1.5 x 6 = 9
Total = 27

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(**I-IV**) will contain two questions(each carrying 4.5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 1.5 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Partial differential equations: Formation, order and degree, Linear and Non-Linear Partial differential equations of the first order: Complete solution, singular solution, General solution, Solution of Lagrange's linear equations, Charpit's general method of solution. Compatible systems of first order equations, Jacobi's method.

Section – II
Linear partial differential equations of second and higher orders, Linear and non-linear homogenious and non-homogenious equations with constant co-efficients, Partial differential eqution with variable co-efficients reducible to equations with constant coefficients, their complimentary functions and particular Integrals, Equations reducible to linear equations with constant co-efficients.

Section – III
Classification of linear partial differential equations of second order, Hyperbolic, parabolic and elliptic types, Reduction of second order linear partial differential equations to Canonical (Normal) forms and their solutions, Solution of linear hyperbolic equations, Monge's method for partial differential equations of second order.

Section – IV
Cauchy's problem for second order partial differential equations, Characteristic equations and characteristic curves of second order partial differential equation, Method of separation of variables: Solution of Laplace's equation, Wave equation (one and two dimensions), Diffusion (Heat) equation (one and two dimension) in Cartesian Co-ordinate system.

Books Recommended:
1. D.A.Murray: Introductory Course on Differential Equations, Orient Longman, (India), 1967
2. Erwin Kreyszing : Advanced Engineering Mathematics, John Wiley & Sons, Inc., New York, 1999
3. A.R. Forsyth : A Treatise on Differential Equations, Macmillan and Co. Ltd.
4. Ian N.Sneddon : Elements of Partial Differential Equations, McGraw Hill Book Company, 1988
5. Frank Ayres : Theory and Problems of Differential Equations, McGraw Hill Book Company, 1972
6. J.N. Sharma & Kehar Singh : Partial Differential Equations

(w.e.f. 2018-19)

<u>Statics</u>

Paper: BM 233

Max. Marks:

5 x 4 = 20
1 x 6 = 6
Total = 26

Time: 3 Hours

<u>Note:</u> The question paper will consist of **five** sections. Each of the first four sections(**I-IV**) will contain two questions (each carrying 5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 1 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Composition and resolution of forces. Parallel forces. Moments and Couples.

Section – II
Analytical conditions of equilibrium of coplanar forces. Friction. Centre of Gravity.

Section – III
Virtual work. Forces in three dimensions. Poinsots central axis.

Section – IV
Wrenches. Null lines and planes. Stable and unstable equilibrium.

Books Recommended:
1. S.L. Loney : Statics, Macmillan Company, London

2. R.S. Verma : A Text Book on Statics, Pothishala Pvt. Ltd., Allahabad

NEW SCHEME

Scheme of Examination of B.A. 4th Semester Mathematics

(w.e.f. 2018-2019)

Paper Code	Title of the Paper	Allocation of Periods	Maximum Marks			
			Theory	Intternal Assess-ment	Practical	Total
BM 241	Sequences and Series	6 periods/ 4 hours per week	27	6	--	100
BM 242	Special Functions and Integral transforms	6 periods/ 4 hours per week	27	7	--	
BM 243	Programming in C and Numerical Methods	6 periods/ 4 hours per week	20	--	13	

Note:- The other conditions will remain the same as per relevant ordinance and rules and regulations of the University.

(w.e.f. 2018-19)
Sequences and Series

Paper: BM 241

Max. Marks:

4.5 x 4 = 18
1.5 x 6 = 9
Total = 27

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 4.5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 1.5 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Boundedness of the set of real numbers; least upper bound, greatest lower bound of a set, neighborhoods, interior points, isolated points, limit points, open sets, closed set, interior of a set, closure of a set in real numbers and their properties. Bolzano-Weiestrass theorem, Open covers, Compact sets and Heine-Borel Theorem.

Section – II
Sequence: Real Sequences and their convergence, Theorem on limits of sequence, Bounded and monotonic sequences, Cauchy's sequence, Cauchy general principle of convergence, Subsequences, Subsequential limits.

Infinite series: Convergence and divergence of Infinite Series, Comparison Tests of positive terms Infinite series, Cauchy's general principle of Convergence of series, Convergence and divergence of geometric series, Hyper Harmonic series or p-series.

Section – III
Infinite series: D-Alembert's ratio test, Raabe's test, Logarithmic test, de Morgan and Bertrand's test, Cauchy's Nth root test, Gauss Test, Cauchy's integral test, Cauchy's condensation test.

Section – IV
Alternating series, Leibnitz's test, absolute and conditional convergence, Arbitrary series: abel's lemma, Abel's test, Dirichlet's test, Insertion and removal of parenthesis, re-arrangement of terms in a series, Dirichlet's theorem, Riemann's Re-arrangement theorem, Pringsheim's theorem (statement only), Multiplication of series, Cauchy product of series, (definitions and examples only) Convergence and absolute convergence of infinite products.

Books Recommended:
1. R.R. Goldberg : Real Analysis, Oxford & I.B.H. Publishing Co., New Delhi, 1970
2. S.C. Malik : Mathematical Analysis, Wiley Eastern Ltd., Allahabad.
3. Shanti Narayan : A Course in Mathematical Analysis, S.Chand and company, New Delhi
4. Murray, R. Spiegel : Theory and Problems of Advanced Calculus, Schaum Publishing co., New York
5. T.M. Apostol: Mathematical Analysis, Narosa Publishing House, New Delhi, 1985
6. Earl D. Rainville, Infinite Series, The Macmillan Co., New York

(w.e.f. 2018-19)
Special Functions and Integral Transforms

Paper: BM 242

Max. Marks:

4.5 x 4 = 18
1.5 x 6 = 9
Total = 27

Time: 3 Hours

<u>Note:</u> The question paper will consist of **five** sections. Each of the first four sections(***I-IV***) will contain two questions(each carrying 4.5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 1.5 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Series solution of differential equations – Power series method, Definitions of Beta and Gamma functions. Bessel equation and its solution: Bessel functions and their properties-Convergence, recurrence, Relations and generating functions, Orthogonality of Bessel functions.

Section – II
Legendre and Hermite differentials equations and their solutions: Legendre and Hermite functions and their properties-Recurrence Relations and generating functions. Orhogonality of Legendre and Hermite polynomials. Rodrigues' Formula for Legendre & Hermite Polynomials, Laplace Integral Representation of Legendre polynomial.

Section – III
Laplace Transforms – Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems, Laplace transforms of derivatives and integrals, Differentiation and integration of Laplace transforms, Convolution theorem, Inverse Laplace transforms, convolution theorem, Inverse Laplace transforms of derivatives and integrals, solution of ordinary differential equations using Laplace transform.

Section – IV
Fourier transforms: Linearity property, Shifting, Modulation, Convolution Theorem, Fourier Transform of Derivatives, Relations between Fourier transform and Laplace transform, Parseval's identity for Fourier transforms, solution of differential Equations using Fourier Transforms.

Books Recommended:
1. Erwin Kreyszing : Advanced Engineering Mathematics, John Wiley & Sons, Inc., New York, 1999
2. A.R. Forsyth : A Treatise on Differential Equations, Macmillan and Co. Ltd.
3. I.N. Sneddon : Special Functions on mathematics, Physics & Chemistry.
4. W.W. Bell : Special Functions for Scientists & Engineers.
5. I.N. Sneddon: the use of integral transform, McGraw Hill, 1972
6. Murray R. Spiegel: Laplace transform, Schaum's Series.

(w.e.f. 2018-19)
Programming in C and Numerical Methods

Part-A (Theory)

Paper: BM 243

Max. Marks:

3.5 x 4 = 14
1 x 6 = 6
Total = 20

Time: 3 Hours

Note:- The question paper will consist of **five** sections. Each of the first four sections   (***I-IV***) will contain two questions (each carrying 3.5 marks), and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 1 marks) without any internal choice covering the entire syllabus and shall be **compulsory**.

Section – I

Programmer's model of a computer, Algorithms, Flow charts, Data types, Operators and expressions, Input / outputs functions.

Section – II

Decisions control structure: Decision statements, Logical and conditional statements, Implementation of Loops, Switch Statement & Case control structures. Functions, Preprocessors and Arrays.

Section – III

Strings: Character Data Type, Standard String handling Functions, Arithmetic Operations on Characters. Structures: Definition, using Structures, use of Structures in Arrays and Arrays in Structures. Pointers: Pointers Data type, Pointers and Arrays, Pointers and Functions.
Solution of Algebraic and Transcendental equations: Bisection method, Regula-Falsi method, Secant method, Newton-Raphson's method. Newton's iterative method for finding pth root of a number, Order of convergence of above methods.

Section – IV

Simultaneous linear algebraic equations: Gauss-elimination method, Gauss-Jordan method, Triangularization method (LU decomposition method). Crout's method, Cholesky Decomposition method. Iterative method, Jacobi's method, Gauss-Seidal's method, Relaxation method.

Books Recommended:
1.   B.W. Kernighan and D.M. Ritchie : The C Programming Language, 2nd Edition
2.   V. Rajaraman : Programming in C, Prentice Hall of India, 1994
3.   Byron S. Gottfried : Theory and Problems of Programming with C, Tata McGraw-Hill Publishing Co. Ltd., 1998
4.   M.K. Jain, S.R.K.Lyengar, R.K. Jain : Numerical Method, Problems and Solutions, New Age International (P) Ltd., 1996
5.   M.K. Jain, S.R.K. Lyengar, R.K. Jain : Numerical Method for Scientific and Engineering Computation, New Age International (P) Ltd., 1999
6.   Computer Oriented Numerical Methods, Prentice Hall of India Pvt. Ltd.
7.   Programming in ANSI C, E. Balagurusamy, Tata McGraw-Hill Publishing Co. Ltd.
8.   Programming in ANSI C, E. Balagurusamy, Tata McGraw-Hill Publishing Co. Ltd.
9.   Babu Ram: Numerical Methods, Pearson Publication.
10. R.S. Gupta, Elements of Numerical Analysis, Macmillan's India 2010.

Part-B (Practical)

Max. Marks: 13

Time: 3 Hours

There will be a separate practical paper which will consist simple programs in C and the implementation of Numerical Methods, studied in the paper BM 243 (Part-A).

NEW SCHEME

Scheme of Examination of B.A. 5th Semester Mathematics

(w.e.f. 2018-2019)

Paper Code	Title of the Paper	Allocation of Periods	Maximum Marks			
			Theory	Internal Assessment	Practical	Total
BM 351	Real Analysis	6 periods/ 4 hours per week	27	6	--	100
BM 352	Groups and Rings	6 periods/ 4 hours per week	27	7	--	
BM 363	Numerical Analysis	6 periods/ 4 hours per week	20	--	13	

Note:- The other conditions will remain the same as per relevant ordinance and rules and regulations of the University.

(w.e.f. 2018-19)
Real Analysis

Paper: BM 351

Max. Marks:

4.5 x 4 = 18
1.5 x 6 = 9
Total = 27

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 4.5 marks), and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 1.5 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Riemann integral, Integrabililty of continuous and monotonic functions, The Fundamental theorem of integral calculus. Mean value theorems of integral calculus.

Section – II
Improper integrals and their convergence, Comparison tests, Abel's and Dirichlet's tests, Frullani's integral, Integral as a function of a parameter. Continuity, Differentiability and integrability of an integral of a function of a parameter.

Section – III
Definition and examples of metric spaces, neighborhoods, limit points, interior points, open and closed sets, closure and interior, boundary points, subspace of a metric space, equivalent metrics, Cauchy sequences, completeness, Cantor's intersection theorem, Baire's category theorem, contraction Principle

Section – IV
Continuous functions, uniform continuity, compactness for metric spaces, sequential compactness, Bolzano-Weierstrass property, total boundedness, finite intersection property, continuity in relation with compactness, connectedness , components, continuity in relation with connectedness.

Book s Recommended:
1. P.K. Jain and Khalil Ahmad: Metric Spaces, 2nd Ed., Narosa, 2004
2. T.M. Apostol: Mathematical Analysis, Narosa Publishing House, New Delhi, 1985
3. R.R. Goldberg : Real analysis, Oxford & IBH publishing Co., New Delhi, 1970
4. D. Somasundaram and B. Choudhary : A First Course in Mathematical Analysis, Narosa Publishing House, New Delhi, 1997
5. Shanti Narayan : A Course of Mathematical Analysis, S. Chand & Co., New Delhi
6. E.T. Copson, Metric Spaces, Cambridge University Press, 1968.
7. G.F. Simmons : Introduction to Topology and Modern Analysis, McGraw Hill, 1963.

(w.e.f. 2018-19)
Groups and Rings

Paper: BM 352

Max. Marks:

4.5 x 4 = 18
1.5 x 6 = 9
Total = 27

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 4.5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 1.5 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Definition of a group with example and simple properties of groups, Subgroups and Subgroup criteria, Generation of groups, cyclic groups, Cosets, Left and right cosets, Index of a sub-group Coset decomposition, Largrage's theorem and its consequences, Normal subgroups, Quotient groups,

Section – II
Homoomorphisms, isomophisms, automorphisms and inner automorphisms of a group. Automorphisms of cyclic groups, Permutations groups. Even and odd permutations. Alternating groups, Cayley's theorem, Center of a group and derived group of a group.

Section – III
Introduction to rings, subrings, integral domains and fields, Characteristics of a ring. Ring homomorphisms, ideals (principle, prime and Maximal) and Quotient rings, Field of quotients of an integral domain.

Section – IV
Euclidean rings, Polynomial rings, Polynomials over the rational field, The Eisenstein's criterion, Polynomial rings over commutative rings, Unique factorization domain, R unique factorization domain implies so is $R[X_1 , X_2……X_n]$

Books Recommended:
1. I.N. Herstein : Topics in Algebra, Wiley Eastern Ltd., New Delhi, 1975

2. P.B. Bhattacharya, S.K. Jain and S.R. Nagpal : Basic Abstract Algebra (2nd edition).
3. Vivek Sahai and Vikas Bist : Algebra, NKarosa Publishing House.
4. I.S. Luther and I.B.S. Passi : Algebra, Vol.-II, Norsa Publishing House.
5. J.B. Gallian: Abstract Algebra, Narosa Publishing House.

(w.e.f. 2018-19)
Numerical Analysis

Part-A (Theory)
Paper: BM 363

Max. Marks:

3.5 x 4 = 14
1 x 6 = 6
Total = 20

Time: 3 Hours

Note:- The question paper will consist of **five** sections. Each of the first four sections   (*I-IV*) will contain two questions (each carrying 3.5 marks), and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 1 marks) without any internal choice covering the entire syllabus and shall be **compulsory**.

Section – I

Finite Differences operators and their relations. Finding the missing terms and effect of error in a difference tabular values, Interpolation with equal intervals: Newton's forward and Newton's backward interpolation formulae. Interpolation with unequal intervals: Newton's divided difference, Lagrange's Interpolation formulae, Hermite Formula.

Section – II

Central Differences: Gauss forward and Gauss's backward interpolation formulae, Sterling, Bessel Formula.
Probability distribution of random variables, Binomial distribution, Poisson's distribution, Normal distribution: Mean, Variance and Fitting.

Section – III

Numerical Differentiation: Derivative of a function using interpolation formulae as studied in Sections –I & II.
Eigen Value Problems: Power method, Jacobi's method, Given's method, House-Holder's method, QR method, Lanczos method.

Section – IV

Numerical Integration: Newton-Cote's Quadrature formula, Trapezoidal rule, Simpson's one-third and three-eighth rule, Chebychev formula, Gauss Quadrature formula.
Numerical solution of ordinary differential equations: Single step methods-Picard's method. Taylor's series method, Euler's method, Runge-Kutta Methods. Multiple step methods; Predictor-corrector method, Modified Euler's method, Milne-Simpson's method.

Books Recommended:

1. Babu Ram: Numerical Methods, Pearson Publication.

2. R.S. Gupta, Elements of Numerical Analysis, Macmillan's India 2010.

3. M.K. Jain, S.R.K.Iyengar, R.K. Jain : Numerical Method, Problems and Solutions, New Age International (P) Ltd., 1996

4. M.K. Jain, S.R.K. Iyengar, R.K. Jain : Numerical Method for Scientific and Engineering Computation, New Age International (P) Ltd., 1999

5. C.E. Froberg : Introduction to Numerical Analysis (2nd Edition).

6.   Melvin J. Maaron : Numerical Analysis-A Practical Approach, Macmillan Publishing Co., Inc., New York

7. R.Y. Rubnistein : Simulation and the Monte Carlo Methods, John Wiley, 1981

8. Radhey S. Gupta: Elements of Numerical Analysis, Macmillan Publishing Co.

Part-B (Practical)

Max. Marks: 13

Time: 3 Hours

There will be a separate practical paper which will consist simple programs in C and the implementation of Numerical Methods, studied in the paper BM 363 (Part-A).

NEW SCHEME

Scheme of Examination of B.A. 6th Semester Mathematics
(w.e.f. 2018-2019)

Paper Code	Title of the Paper	Allocation of Periods	Maximum Marks		
			Theory	Internal Assessment	Total
BM 361	Real and Complex Analysis	6 periods/ 4 hours per week	27	6	
BM 362	Linear Algebra	6 periods/ 4 hours per week	27	7	100
BM 353	Dynamics	6 periods/ 4 hours per week	26	7	

Note:- The other conditions will remain the same as per relevant ordinance and rules and regulations of the University.

(w.e.f. 2018-19)

Real and Complex Analysis

Paper: BM 361

Max. Marks:

4.5 x 4 = 18
1.5 x 6 = 9
Total = 27

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 4.5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 1.5 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I

Jacobians, Beta and Gama functions, Double and Triple integrals, Dirichlets integrals, change of order of integration in double integrals.

Section – II

Fourier's series: Fourier expansion of piecewise monotonic functions, Properties of Fourier Co-efficients, Dirichlet's conditions, Parseval's identity for Fourier series, Fourier series for even and odd functions, Half range series, Change of Intervals.

Section – III

Extended Complex Plane, Stereographic projection of complex numbers, continuity and differentiability of complex functions, Analytic functions, Cauchy-Riemann equations. Harmonic functions.

Section – IV

Mappings by elementary functions: Translation, rotation, Magnification and Inversion. Conformal Mappings, Mobius transformations. Fixed pints, Cross ratio, Inverse Points and critical mappings.

Books Recommended:

1. T.M. Apostol: Mathematical Analysis, Narosa Publishing House, New Delhi, 1985

2. R.R. Goldberg : Real analysis, Oxford & IBH publishing Co., New Delhi, 1970

3. D. Somasundaram and B. Choudhary : A First Course in Mathematical, Analysis, Narosa Publishing House, New Delhi, 1997

4. Shanti Narayan : A Course of Mathematical Analysis, S. Chand & Co., New Delhi

5. R.V. Churchill & J.W. Brown: Complex Variables and Applications, 5th Edition, McGraw-Hill, New York, 1990

6. Shanti Narayan : Theory of Functions of a Complex Variable, S. Chand & Co., New Delhi.

(w.e.f. 2018-19)
Linear Algebra

Paper: BM 362

Max. Marks:

4.5 x 4 = 18
1.5 x 6 = 9
Total = 27

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(***I-IV***) will contain two questions(each carrying 4.5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 1.5 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Vector spaces, subspaces, Sum and Direct sum of subspaces, Linear span, Linearly Independent and dependent subsets of a vector space. Finitely generated vector space, Existence theorem for basis of a finitely generated vactor space, Finite dimensional vector spaces, Invariance of the number of elements of bases sets, Dimensions, Quotient space and its dimension.

Section – II
Homomorphism and isomorphism of vector spaces, Linear transformations and linear forms on vactor spaces, Vactor space of all the linear transformations Dual Spaces, Bidual spaces, annihilator of subspaces of finite dimentional vactor spaces, Null Space, Range space of a linear transformation, Rank and Nullity Theorem,

Section – III
Algebra of Liner Transformation, Minimal Polynomial of a linear transformation, Singular and non-singular linear transformations, Matrix of a linear Transformation, Change of basis, Eigen values and Eigen vectors of linear transformations.

Section – IV
Inner product spaces, Cauchy-Schwarz inequality, Orthogonal vectors, Orthogonal complements, Orthogonal sets and Basis, Bessel's inequality for finite dimensional vector spaces, Gram-Schmidt, Orthogonalization process, Adjoint of a linear transformation and its properties, Unitary linear transformations.

Books Recommended:
1. I.N. Herstein : Topics in Algebra, Wiley Eastern Ltd., New Delhi, 1975
2. P.B. Bhattacharya, S.K. Jain and S.R. Nagpal : Basic Abstract Algebra (2nd edition).
3. Vivek Sahai and Vikas Bist : Algebra, Narosa Publishing House.
4. I.S. Luther and I.B.S. Passi : Algebra, Vol.-II, Narosa Publishing House.

(w.e.f. 2018-19)
<u>Dynamics</u>

Paper: BM 353

Max. Marks:

5 x 4 = 20
1 x 6 = 6
Total = 26

Time: 3 Hours

<u>Note:</u> The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions (each carrying 5 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 1 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Velocity and acceleration along radial, transverse, tangential and normal directions. Relative velocity and acceleration. Simple harmonic motion. Elastic strings.

Section – II
Mass, Momentum and Force. Newton's laws of motion. Work, Power and Energy. Definitions of Conservative forces and Impulsive forces.

Section – III
Motion on smooth and rough plane curves. Projectile motion of a particle in a plane. Vector angular velocity.

Section – IV
General motion of a rigid body. Central Orbits, Kepler laws of motion. Motion of a particle in three dimensions. Acceleration in terms of different co-ordinate systems.

Books Recommended:
1. S.L.Loney : An Elementary Treatise on the Dynamics of a Particle and a Rigid Bodies, Cambridge University Press, 1956

2. F. Chorlton : Dynamics, CBS Publishers, New Delhi

3. A.S. Ramsey: Dynamics Part-1&2, CBS Publisher & Distributors.

SCHEME OF EXAMINATION

&

SYLLABI

of

BACHELOR OF COMMERCE (PASS COURSE)

INDIRA, GANDHI UNIVERSITY MEERPUR, REWARI (HARYANA)

Indira Gandhi Univrsity, Meerpur, Rewari
B.Com (Pass Course)
Scheme of Examinations & Syllabi w.e.f session 2017-18

B.Com-I (Ist Semester)

S.No.	Nomenclature of the Paper	Theory Marks	Internal Assessment	Total Marks	Time
1.01	Financial Accounting-I	80	20	100	3 Hrs.
1.02	Business Mathematics-I	80	20	100	3 Hrs.
1.03	Business Economics-I	80	20	100	3 Hrs.
1.04	Business Management –I	80	20	100	3 Hrs.
1.05	Business Communication Skills	80	20	100	3 Hrs
1.06	Basics of computers-I	50	50 (Practical)	100	3 Hrs

Total Marks = 600

B.Com-I (IInd Semester)

S.No.	Nomenclature of the Paper	Theory Marks	Internal Assessment	Total Marks	Time
2.01	Financial Accounting -II	80	20	100	3 Hrs.
2.02	Business Mathematics-II	80	20	100	3 Hrs.
2.03	Business Economics-II	80	20	100	3 Hrs.
2.04	Business Management –II	80	20	100	3 Hrs.
2.05	Business Environment	80	20	100	3 Hrs.
2.06	Basics of computers-II	50	50 (Practical)	100	3 Hrs.

Total Marks = 600

Environmental Studies (Qualifying Paper)

Total marks of Ist Year (1st and 2nd Semester) = 600 + 600 =1200

B.Com-II (Pass Course)
Scheme of Examinations & Syllabi w.e.f. session 2017-18

B.Com-II -IIIrd Semester

S.No.	Nomenclature of the Paper	Theory Marks	Internal Assessment	Total Marks	Time
3.01	Corporate Accounting-I	80	20	100	3 Hrs.
3.02	Business Statistics-I	80	20	100	3 Hrs.
3.03	Business Regulatory Framework-I	80	20	100	3 Hrs.
3.04	Corporate Law-I	80	20	100	3 Hrs.
3.05	Human Resource Management	80	20	100	3 Hrs.
3.06	Optional (Any one from the followings)	80	20	100	3 Hrs.

    i. Fundamental of Insurance
    ii. Basics of Retailing
    iii. Production Management
    iv. Computer: Application of Information Technology in Business –I

Total Marks = 600

B.Com-II –IVth Semester

S.No.	Nomenclature of the Paper	Theory Marks	Internal Assessment	Total Marks	Time
4.01	Corporate Accounting-II	80	20	100	3 Hrs.
4.02	Business Statistics-II	80	20	100	3 Hrs.
4.03	Business Regulatory Framework-II	80	20	100	3 Hrs.
4.04	Corporate Law-II	80	20	100	3 Hrs.
4.05	Marketing Management	80	20	100	3 Hrs.
4.06	Optional (Any one from the followings)	80	20	100	3 Hrs.

    i. Business Ethics
    ii. Banking and Banking Law
    iii. Secretarial Practices
    iv. Computer: Application of Information Technology in Business –II

Total Marks = 600

Total Marks of IInd Year (3rd and 4th Semester) = 600 + 600 = 1200

B.Com (Pass Course)
Scheme of Examinations w.e.f session 2017-18

B.Com-III –Vth Semester

S.No.	Nomenclature of the Paper	Theory Marks	Internal Assessment	Total Marks	Time
5.01	Taxation Law -I	80	20	100	3 Hrs.
5.02	Cost Accounting-I	80	20	100	3 Hrs.
5.03	Accounting for Management	80	20	100	3 Hrs.
5.04	Financial Market Operations	80	20	100	3 Hrs.
5.05	Entrepreneurship and Small Scale Business	80	20	100	3Hrs.
5.06	Optional (Any one out of followings)	80	20	100	3 Hrs.
	i. International Trade				
	ii. Investment Management				
	iii. Computer: Essentials of E-Commerce-I				
	iv. International Business Environment				

Total Marks = 600

B.Com-III –VIth Semester

S.No.	Nomenclature of the Paper	Theory Marks	Internal Assessment	Total Marks	Time
6.01	Taxation Law-II	80	20	100	3 Hrs.
6.02	Cost Accounting -II	80	20	100	3 Hrs.
6.03	Financial Management	80	20	100	3 Hrs.
6.04	Auditing	80	20	100	3 Hrs.
6.05	Goods and Services Tax & Customs Law	80	20	100	3 Hrs.
6.06	Optional (any one out of the followings)	80	20	100	3 Hrs
	i. International Marketing				
	ii. Fundamentals of Operations Research				
	iii. Computer: Essentials of E-Commerce-II				
	iv. Tax Planning and Management				

Total Marks = 600

Total Marks of IIIrd Year(5th & 6th Semester) = 600 + 600 = 1200

Grand Total of B.Com. (Pass Course) = 1200+1200+1200 = 3600 Marks

B.Com I First Semester w.e.f session 2017-18

Financial Accounting –I
Code: 1.01

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                         Internal marks: 20

Note: The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Important: The Examiner will set at least THREE numerical and THREE theoretical questions in the question paper. .

Unit-I
Introduction: meaning, objectives, process, limitations and basic terms of Accounting; Generally accepted Accounting Principles; Journalizing, Posting and Preparation of trial balance.

Unit-II
Capital and revenue items; Reserves and Provisions; Depreciation: Meaning, causes, accounting procedure, methods of computing depreciation – straight line method and diminishing balance method, change of method.

Unit-III
Final Accounts with adjustments; Rectification of errors

Unit-IV
Accounting for non-profit organizations; Consignment accounts.

Suggested Readings:
1.Gupta R.L. and Radha Swami M., Financial Accounting, Sultan Chand and Sons., New Delhi.
2.Monga J.R., Ahuja Girish and Sehgal Ashok: Financial Accounting, Mayur Paper Back, Noida.
3.Shukla M.C., Grewal T.S. and Gupta S.C.; Advanced Accounts, S. Chand and Company, New Delhi.
4. Goel, D.K., Financial Accounting, Arya Publications, New Delhi

B.Com I First Semester w.e.f session 2017-18
Business Mathematics-I
Code: 1.02

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                           Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Important: The Examiner will set at least THREE numerical and THREE theoretical
questions in the question paper. .

Unit-I

Indices and Logarithms; Theory of Sets: Meaning, elements, types, presentation and equality of Sets, Union, Intersection, Complement and Difference of Sets, Venn Diagram, Cartesian Product of two Sets, Applications of Set Theory.

Unit-II

Elementary idea of Permutations and Combinations.

Unit-III

Sequence and Series, A.P, G.P.

Unit-IV

Data interpretation- Introduction, approaches to data interpretation, tabulation, Bar graphs, Pie charts, Line graphs, Mix graphs

Suggested Readings:
Allen B.G.D: Basic Mathematics; Mcmillan, New Delhi.
Volra. N. D. Quantitative Techniques in Management, Tata McGraw Hill, New Delhi. Kapoor V.K.
Business Mathematics: Sultan chand and sons, Delhi.

B.Com I First Semester w.e.f session 2017-18
Business Economics-I
Code: 1.03

Time: 3 Hours

Theory Paper Max Marks: 80
Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I

Introduction: Basic problem of an economy: working of price mechanism, concept of Elasticity of demand; measurement, **importance, determinants of elasticity of demand**, Average revenue; marginal revenue and elasticity of demand and **elasticity of supply**

Unit-II

Production Function: Law of variable proportions; Isoquants; Economic regions and optimum factor combination; expansion path; returns to scale; Internal and external economies and diseconomies; Ridge lines; Theory of costs: concepts of cost; Short run and Long run cost curves- Traditional and Modern approaches.

Unit- III

Theory of consumer behaviour, utility and indifference curve analysis

Unit-IV

Market, classification and structure.

Suggested Readings:

1. Dr. Raj Kumar, Prof. Kuldeep Gupta, Business Economics, UDH Publishing and Distributors P(Ltd.), New Delhi.
2. R.K Lekhi, Business Economics, Kalyani Publishers.
3. V.G.Mankar, Business Economics, Himalaya Publishing House.
4.H.L.Ahuja, Business Economics, S. Chand and Company Ltd.

B.Com I First Semester w.e.f session 2017-18
Business Management-I
Code: 1.04

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                      Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I

Business: concept, nature and spectrum of business activities, business system, business objectives.

Unit-II

Management: Introduction, concept, nature, process and significance; Development of Management Thought; Classical and Neo-Classical systems, Contingency approaches.

Unit-III

Planning: concept, types and process, Decision Making: concept and process, Management by Objectives, Corporate Planning and Strategic Formulation.

Unit-IV

Organizing: concept, nature, process and significance; Authority and Responsibility relationship; Centralization and Decentralization; Departmentation; Firms of Organizing structure.

Suggested Readings:

1. Druker. Peter F. Management Challenges for the 21st century; Butter worth Heinemann Oxford.
2. Weihrich and Koontz, O. Donnel: Essential of Management Tata Mc Graw Hill, New Delhi.
3. Parsad L. M., Principles and Practice of Management.: Sultan Chand and Sons.

B.Com I First Semester w.e.f session 2017-18
Business Communication Skills
Code: 1.05

Time: 3 Hours

Theory Paper Max Marks: 80
Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I

Introduction: Basics of communication, Seven C's of effective communication, barriers to communication, ethical context of communication.

Unit-II

Business Communication at workplace: Letter writing- component, layout and process, E- mail communication, bad news messages, persuasive written communication, memos, notice, agenda and minutes of meeting.

Unit-III

Report Writing: Types of business reports, structure of reports, short reports, long reports, abstracts and summaries, proposals.

Unit-IV

Communication Skills: Reading skills, listening skills, note making, persuasive speaking. Body language, Gestures.

Suggested Readings:
1.Murphy, Herta A., Herbert W. Hildebrandj and Jane P. Thomas, Effective Business Communication,
Tata McGraw Hill, New Delhi.
2. Konera Arun, Professional Communication, Tata McGraw Hill, New Delhi.
3. McGrath, E. H., Basic Managerial Skills for All,PHI, New Delhi.
4. Meenakshi Raman and Parkash Singh, Business Communication, Oxford University Press, New Delhi.

Time : 3 Hrs   **Theory Paper Max Marks-50**
                                                             Practical Marks = 50

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 5 small questions of two marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 10 marks each.

Unit-1
Introduction to Computers: Definition of Computer; Components of Computer; Characteristics of Computers; History evolution of Computers; Generation of computers; Classification of Computers- According to Purpose, According to Technology , According to Size and Storage Capacity ; Human being VS Computer; Difference between Computer and Calculator.

Unit-2
Input Devices: Mouse, Keyboard, Light pen, Track Ball, Joystick, MICR, Optical Mark reader and Optical Character Reader Scanners, Voice system, Web Camera.
Output Devices: Hard Copy Output Devices; Line Printers, Character Printers, Chain Printers, Dot-matrix Printers, Daisy Wheel Printer, Laser Printers, Ink Jet Printers; Plotters, Soft Copy device –Monitor, Sound Cards and speakers.
Unit-3
Memory and Mass Storage Devices: Characteristics of Memory Systems; Memory Hierarchy; Types of Primary Memory; RAM and ROM; Secondary and Back-up; Magnetic Disks, Characteristics and classification of Magnetic Disks; Optical Disks; Magnetic Taps.
Unit-4
MS- Word: Fundamentals of MS-Word, Features of MS-Word, Menus, Formatting and Standard Toolbars, Ruler, Scroll Bar, Creating, Editing, Saving, export and import files, inserting and copying the files, Working with frames, Paragraph formatting, Columns, Pictures, Tables, Macros and Mail Merge.

Suggested Readings:
1. *Introduction of Information System ALEXISLEON,*
2. *Computer Fundamentals-Nasib Singh Gill.*

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                          Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Important: The Examiner will set at least THREE numerical and THREE theoretical questions in the question paper. .

Unit-I

Hire Purchase System and Installment Payment Systems.

Unit-II

Branch Accounts (including foreign branch) and Departmental Accounts.

Unit-III

Amalgamation and sale of partnership firms, Dissolution of Partnership Firm- Insolvency of Partners (including Garner v/s Murrey Rule), Gradual Realisation and Piecemeal Distribution.

Unit-IV

Joint-Venture Account; Royalty Account.

Suggested Readings:
1.Gupta R.L. and Radha Swami M., Financial Accounting, Sultan Chand and Sons., New Delhi.
2.Monga J.R., Ahuja Girish and Sehgal Ashok: Financial Accounting, Mayur Paper Back, Noida.
3.Shukla M.C., Grewal T.S. and Gupta S.C.; Advanced Accounts, S. Chand and Company, New Delhi.
4. Goel, D.K., Financial Accounting, Arya Publications, New Delhi

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                          Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Important: The Examiner will set at least THREE numerical and theoretical questions in the question paper.

Unit-I

Matrices and Determinants: Definition of a Matrix ; Types of Matrices, Algebra of Matrices; Calculation of values of Determinants up to third order; adjoint of a Matrix, elementary row and column operations; Finding inverse matrix through adjoint and elementary row or column operations; Solution of a system of Linear equations having unique Solution and involving not more than three variables

Unit-II

Differentiation (only algebraic problem) ; Application of differentiation

Unit-III

Compound Interest and Annuities: Certain different types of interest rate; Concept of present value and amount of a sum; Types of annuities; Present value and amount of an annuity, including the case of continuous compounding

Unit-IV

Ratio, Proportion and Percentage; Profit and Loss

Suggested Readings:
1. *Allen B.G.D: Basic Mathematics; Mcmillan, New Delhi.*
2. *Vohra. N. D. Quantitative Techniques in Management, Tata McGraw Hill, New Delhi.*
3. *Kapoor V.K. Business Mathematics: Sultan chand and sons, Delhi.*

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                         Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I
Perfect Competition: Profit Maximization and equilibrium of firm and industry; Short run and Long run Supply Curves; Price and output determination, Practical Applications.
Monopoly: Determination of price under Monopoly; Equilibrium of a firm; comparison between Monopoly and Perfect Competition; Price Discrimination; Multi-Plant Monopoly, Practical Applications.

Unit-II
Monopolistic Competition: Meaning and Characteristics; price and output determination under monopolistic Competition; Product differentiation; Selling cost; comparison with Perfect Competition; Excess capacity under Monopolistic Competition, **Oligopoly : features, price rigidity model, duopoly model, price leadership.**

Unit-III
Marginal Productivity Theory and demand for factors; nature of supply of factor inputs, Determination of wage rates under perfect competition and monopoly. Exploitation of labour; Rent- Concept, Recardian concept and Modern Theories of rent; Quasi Rent.

Unit-IV
Interest- concept and Theories of interest; Profit- nature, concept and theories of profit, **break-even point analysis.**

Suggested Readings:
1. Dr. Raj Kumar, Prof. Kuldeep Gupta, Business Economics, UDH publishing and distributors p (Ltd.), New Delhi.
2. R.K Lekhi, Business Economics, Kalyani Publishers.
3. V.G.Mankar, Business Economics, Himalaya Publishing House.
4. H.L.Ahuja, Business Economics, S. Chand and Company Ltd.

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                                   Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I

Staffing: concept, nature and scope, Matching job and people; Recruitment; Selection and Training of employees.

Unit-II

Motivation and Leadership: Motivation-concept, Theories-Maslow, Herzberg, Megregor and Quchi; Financial and Non-Financial Incentives.
Leadership: concept and Leadership styles, Leadership Theories.

Unit-III

Communication and Control: Communication Concept, Nature, Types and Process, Barriers and Remedies.

Control: Concept, Process and Techniques, Effective Control System.

Unit-IV

Management of Change: Concept, Nature and Process of Planned Change: Resistance to Change; Emerging Horizons of management in a changing environment.

Suggested Readings:

1.   *Druker. Peter F. Management challenges for the 21st century; Butter worth Heinemann Oxford.*
2.   *Weihrich and Koontz, O. Donnel: Essential of Management. Tata McGraw Hill, New Delhi.*
3.   *Parsad L. M., Principles and Practice of Management.: Sultan Chand and Sons.*

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                                      Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I

Business Environment: concept; components and importance; SWOT Analysis.

Unit-II

Economic Trends (overview): income; savings and investment; industry; Trade and balance of payments.

Unit-III

Problems of Growth: Unemployment, regional imbalances, inflation, parallel economy and industrial sickness.

Unit-IV

Role of Govt. in Indian Economy: Monetary and Fiscal Policy; Industrial Policy; Privatization.

Suggested Readings:
1. Agarwal A.N. , Indian Economy, Vikas Publishing House, New Delhi.
2. Mirsra and Puri; Indian Economy; Himalaya Publishing House, New Delhi.
3. Hedge Lanl, Environmental Economics; McMillan Hampshire.

Time : 3 Hrs   **Theory Paper Max Marks-50**
                                                            Practical Marks = 50

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 5 small questions of two marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 10 marks each.

Unit-1
Fundamental of computers: Model of a digital computer; Functioning of a digital computer; Types of a digital computer; Advantages of computers. Difference between digital computer and analog computer, Applications of computers: Computers in Commerce, Marketing, Education and Management.

Unit-2
Software concepts: Types of Software and their role, Different System Software types- Operating systems, Translators, System Utilities; Concept of Application Packages; Types of an Operating system- Multi-user O.S., Multi-tasking O.S., Multi-Processing O.S; Time – sharing O.S., Multi-Programming O.S.Operating System as a resource Manager, concept of GUI and CUI.

Unit-3
Introduction to Windows: Components of a Application Window; Types of Windows, Windows as an Operating System, Windows explorer, Using Paintbrush, Control Panel, Installing a printer. User interfaces- CUI and GUI; Concept of a Desktop and Taskbar, My Computer, Recycle Bin, My Documents and Internet Explorer icons.

Unit-4
MS-Excel: Applications of a Spreadsheet; Advantages of an Spreadsheet; Features of Excel; Rows, Columns, Cell, Menus, Creating worksheet, Formatting, Printing, establishing worksheet links, Table creating and printing graphs, Macros, Using Built-in-functions.

Suggested Readings:
1. *Introduction of Information System ALEXISLEON*
2. *Introduction to essential tools. Sushila Madan.*

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                                       Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Important: *The Examiner will set at least THREE numerical and THREE theoretical questions in the question paper.*

Unit- I

Share Capital: Meaning, types, Accounting Treatment of issue, forfeiture and reissue of Share; Buy-back of equity shares & **Sweat shares**; Redemption of preference share; Issue of Bonus Share.

Unit- II

Debenture: Meaning, Types. Issue and Redemption of Debentures.

Unit-III

Valuation of Goodwill: Meaning, objectives, determinates and main methods. Valuation of Shares: Meaning, objectives, determinates and main methods.

Unit- IV

Profit or loss before and after incorporation. Final accounts of companies.

Suggested Readings:

*1. Shukla M.C, Grewal T.S and Gupta S.C. **Advance Accounts***: *S.Chand & comp., New Delhi.*

*2. Gupta R.L & Radha Swami M. **Company Account***: *Sultan Chand, New Delhi.*

*3. Monga J.R ,.Ahuja Girish and sehgal Ashok **Financial Accounting***: *Mayur paper backs, Noida*

4. Goel, D.K., Corporate Accounting. Arya Publications, New Delhi

B.Com II - **IIIrd Semester w.e.f. session 2017-18**
Paper: Business Statistics- I
Code 3.02

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                                              Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.
Important: The Examiner will set at least THREE numerical and THREE theoretical questions in the question paper.

Unit- I

Introduction of Statistics: Origin, Development, Definition, Scope, Uses and Limitations.

Statistical Data: Types of Measurement scales- normal, Ordinal, Interval and Ratio level measurement; Collection, Classification and Tabulation of Primary and Secondary data.

Presentation of data: Diagrammatic and Graphical presentation of Data-Bar, Squares, rectangular and Circular diagrams; Histogram, frequency polygon, Ogives, Stem and Leaf displays box plots.

Unit- II

Central Tendency and Partition values; Concept and Measures of Central tendency, Quartiles, Deciles, Percentiles.

Dispersion: Concept and Its absolute as well as relative measures.

Unit- III

Moments, Skewness and Kurtosis: Moments about any point and about mean and the relationship between them.

Sheppard's Corrections for Moments. Concept of symmetrical distribution and skewness, measures and Co- efficient of skewness, Concept of Kurtosis and its measures.

Unit- IV

Analysis of Bivariate data:

Correlation-concept, scatter diagram, Karl Pearson's co-efficient of Correlation and its properties Spearman's rank Correlation, Concurrent deviation method

Regression: Meaning and Definition, Difference between Correlation and Regression, Principle of least squares and fitting of a line of best fit to the given data, Regression lines, Properties of regression Co-efficient and Regression lines, standard error of estimate, Co-efficient of determination.

Suggested Readings:

1. Dr.S.P.Gupta, Statistical methods, S.Chand & Co., New Delhi.

2. D.N.Elhance, Veena Elhance, B.M.Aggarwal, Fundamentals of Statistics, Kitab Mahal.

3. N.P.Aggarwal, Quantitative Techniques, Ramesh Book Depot., Jaipur.

4. R.P.Hooda, Statistics for Business and Economics, Mcmillan India Ltd., New Delhi.

Time: 3 Hours   Theory Paper Max Marks: 80
                                                                        Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit- I

Indian Contract Act: - Valid contract and its elements; Void and void able agreements; Void and illegal agreements; Offer and acceptance; Contractual capacity of parties; Free consent of parties; Lawful consideration and object; Agreements expressly declared as void.

Unit- II

Contingent Contracts: - Quasi contracts; Discharge of contracts: - methods of discharge of contracts; Consequences of Breach of contracts.

Contract of Indemnity and guarantee: - Elements of contract of Indemnity; Rights of Indemnity
Holder and indemnifier Guarantee: - features of contract of guarantee; Rights and Liabilities of surely; Discharge of surety; Difference between contract of indemnity and Guarantee.

Unit- III

Contract of Bailment and Pledge: - Meaning; types of bailment, Termination of bailment, Duties and rights of bailor and bailee. Essentials of pledge, who nay pledge, Rights and Duties of Pawnor and Pawnee.

Unit- IV

Consumer protection Act 1986: - Salient features of consumer Protection Act; Rights of consumers;
consumer Protection councils; consumer disputes redressal machinery.

Suggested Readings:

1.   M.C.Kuchhal, Business Laws, Sultan Chand & Co., New Delhi.

2.   N.D.Kapoor, Merchantile Law. Sultan Chand & Co., New Delhi.

3.   Texman

*4.   Resai T.R. **Partnership Act**, S.C.Sarkar and Sons, kolkata.*

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                                         Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit- I

Company- Meaning and Characteristics; Features of company; Types of companies, advantages

and disadvantages of incorporation; Lifting of corporate veil;

Unit- II

Formation of Company: - Promotion of company; Functions of promoter; importance of promoter;

Promoter's remuneration; legal status of Promoter; Rights of promoters; Duties of promoters;

Liabilities of promoters; Pre- incorporation contracts, Incorporation and commencement of Business.

Prospectus: - definition; Public offer, contents; misleading prospectus and its

consequences. **Unit- III**

Memorandum of Association: - Meaning; importance; clauses of memorandum of association and

their Alteration; doctrine of ultra- virus.

Articles of Association: - Meaning; contents; alteration of articles of

association; constructive notice and doctrine of indoor management.

Unit- IV

Borrowing Powers; Debentures and Charges.

Suggested Readings:

1. Kuchal M.C. Modern Indian Company Law Shri Mahavir Books, Noida.

2. Kapoor N.D. Company Law Incorporating the provisions of the

companies Amendment Act.

3. Singh Avtar Company Law Eastern Book Company, Lucknow.

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                          Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I

An Introduction to Human Resource Management
Definition, Importance objectives and scope of Human Resource Management (HRM).
Function of Human Resource Management: - Managerial and Operative Functions.Qualifiction and Qualities of Human Resource manager in our organization.
Evolution and Growth of Human Recourse Management (HRM) India.

Unit-II

Recruitment Selection and Training
Recruitment: - Meaning, Steps in recruitment policy, sources and modes of recruitment, Factors affecting recruitment.
Selection: - Meaning, Essentials of Selection Procedure, Stages in Selection Procedure.
Training: - Concept, Need and importance of Training.
Methods of Training: - On the job Training + off the job Training, Principles of training, Evaluation of training Programme in India.

Unit-III

Wage and Wage Incentives
Wages: - Meaning, Objective and Theories of wages,
Methods of wage Programme: - Time wages and Piece wages methods
Concept of wages**: -** Fair, Minimum and Living wage, Factors determining wage Structure of an organization, essentials of satisfactory wage policy.
Wage Incentives: - Concept, Need and Importance of Incentives. Special Incentives

Prefect sharing and Labour Co. Partnership and Essentials of Ideal Incentives system.

Unit- IV

Industrial Relations and Industrial Unrest
Industrial Relations: - Concept, Importance and Objectives of industrial relations,
Contents of industrial relations. Participants of Industrial relation and Recruitment of good Industrial relation Programme.
Industrial Unrest**: -** Meaning, Forms and Causes of industrial disputes, Impact of Industrial unrest on the Economy, preventive and curative methods and Agencies for Reconciliation of Industrial unrest.

Suggested Readings:

1.   *Human Resource Management: Concepts and Issues, by T.N. Chhabra, Dhanpat Rai & Co. New Delhi.*

2.   *Human Resource Management by R. Wayne Mondy, Pearson Publications, Delhi.*

3.   *Human Resource Management by C.B. Gupta.*

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                                                          Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit- I
Insurance- History and Development; Meaning; Importance; Nature; Main principles- Principles of Cooperation, Probability, at most good faith. Proximate cause, Insurable interest, Indemnity, Subrogation, Warranty.

Unit-II
Life Insurance: - Main Elements, Importance, Important life Insurance Policies, Annuities, Premium Determination under life Insurance.

Unit- III
General Insurance, Marine Insurance- Main Elements, Marine Losses, Types of Marine Insurance policies.
Agriculture Insurance: History, Meaning, Main problems, Policies.

Unit-IV
Fire Insurance- Elements, Premium Determination, Types of Policies. Important Provisions of Moter Insurance, Aircraft Insurance

B.Com II - IIIrd Semester w.e.f. session 2017-18
Optional Paper: Basics of Retailing
Code: 3.06 (ii)

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                    Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I

Introduction: Meaning, nature, scope, importance, growth and present size. Career option in retailing; Technology induction in retailing; Future of retailing in India.

Unit-II

Types of Retailing: Stores classified by owners; Stores classified by merchandising categories; Wheel of retailing; Traditional retail formats *vs.* modern retail formats in India; Store and non-store based formats; Cash and carry business - Meaning, nature and scope; Retailing models – Franchiser - franchisee, directly owned; Wheel of retailing and retailing life cycle; Co-operation and conflict with other retailers.

Unit-III

Management of Retailing Operations: Retailing management and "the total performance model; Functions of retail management; Strategic retail management process.

Unit-IV

Retail planning - importance and process; Developing retailing strategies, objectives, action plans, pricing strategies and location strategies.

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                                          Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I:

Introduction: Concept, nature and scope of Production Management; Evolution of production function; Production Process, Organization of production function; Relationship between production and other functions.

Unit-II:

Location and Layout:

Location: nature, objectives and significance, Theories of location; factors influencing location. Layout:

Meaning, objectives and types; principles of layout; factors affecting layout.

Unit-III:

Production Planning and Control:

Production Planning: Concept, need and Types of Production planning; Production planning techniques. Factors influencing Production Planning.

Production Control: - Meaning, objectives and elements; Control techniques, Production Control in different Production Systems; Benefits & limitations.

Unit-IV:

Quality Control and Plan Maintenance.

Quality control: Meaning, scope, objectives and organization; Quality Control Techniques.

Plant Maintenance: Meaning, scope, objectives, types; Maintenance programme techniques & Organization.

Suggested Reading

1.   *Chaturvedi, M: New Product Development, Wheeler Publications, New Delhi.*

2.   *Majumdar, ramanuj: Product Management in India, Prentice Hall, New Delhi.*

3.   *Moise, S: Successful Product Management, Kogan page, New York.*

4.   *Moore, W.I: Product Planning Management, McGraw Hill, Boston.*

5.   *Quelch, J.A: Cases in Product Management, Irwin, London.*

6.   *Urban, Glen L., John R. Haqnser and Nikilesh Dholakia: Essentials of New Product Management, Prentice Hall, Englewood Cliff, New York.*

B.Com II - IIIrd Semester w.e.f. session 2017-18
Optional Paper: Computer - Application of Information Technology in Business -I
Code: 3.06 (iv)

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                     Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I

Information Technology Basics: Introduction, Types of Information , Quality of Information, Levels of Information, Information processing life cycle, Components of IT, Role of Information technology; Information Technology and Internet services,   Multimedia: Definition, Multimedia Systems, Multimedia Applications.

Electronic Data Interchange: - Basics of EDI, Financial EDI, Advantages and Applications of

EDI **Unit-II**

Data Communication and Computer Networks: Introduction , Modes of Data Communication, Forms of Data Transmission, Data Transmission measurement, Synchronous and Asynchronous Communication, Data Transmission Media: Wire-Cable, Fiber- Optics, Microwave , Communication Satellite, Switching Techniques:- Circuit switching, Message and Packet Switching.

Computer Networks: Introduction, Types of Network, LAN, MAN, WAN, Wireless Network, Network Topologies, Public and Private Networks, Communication Protocol-OSI Model.

Unit-III

Internet Concept and Technologies: Concept and evolution of Internet, Benefit of Internet, Hardware and Software requirement for the Internet, Intranet and Extranet Uses of the Internet, ISPs, Ways to Access the Internet, Internet Accounts, Internet Addressing, Internetworking Tools: Bridges, Routers, Gateways, Basic Internet Services: E-Mail, FTP, Mailing List, , IRC, Telnet, Usenet News group,
WWW, Internet Phone, Uploading and Downloading Information from the Internet, Web Search Engines.

Unit-IV

Applications Software Packages:- Features of word Processing Packages, Spreadsheet Packages, Graphics Packages and Personal Assistance Packages, Database Software (MS Access); Creating data tables, Editing a database, Performing Queries, Generating Reports, Creating and Customizing a Form, Features of MS Access.

Suggested Books:

(1) Introduction to IT, ITL education (Pearson), Published by Dorling Kinderslay (India) Pvt.Ltd., Office:14 Local Shopping Centre, Panchsheel Park, New Delhi-110017, India.

2) Information Technology and Computer Fundamental, Dr. Nasib Singh Gill.

(3)Computer Networks and Internets:Dougleas E.Comer,MS.Narayanan, Published by Dorlling Kinderslay,

(4)) Introduction to Information System:Alexis Leon,McGraw-Hill Education(India)pvt.Ltd. B-4, Sector-63, Dist.Gautam Budh Nagar, Noida, Uttar Pardesh,-201301.

B.Com – II- IVth Semester w.e.f. session 2017-18
Paper: Corporate Accounting-II
Code: 4.01

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                   Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Important: The Examiner will set at least THREE numerical and THREE theoretical questions in the question paper.

Unit- I

Internal Reconstruction; External Reconstruction in the nature of merger and purchase.

Unit- II

Liquidation of a company ; Financial reporting for financial institutions.

Unit- III

Final Accounts of Banking Companies.

Unit- IV

Accounts of Holding Companies.

Suggested Readings:

*Shukla M.C, Grewal T.S and Gupta S.C **Advance Accounts**: S.Chand and Comp., New Delhi. Gupta R.L & Radha Swami M. **Company Accounts**: Sultan Chand and sons, New Delhi.*

*Monga J.R. ,Ahuja Girish and Sehgal Ashok **Financial Accounting**: Mayur Paper Bags, Noida. Goel,*

D.K., Corporate Accounting. Arya Publications, New Delhi

B.Com – II- IVth Semester w.e.f. session 2017-18 Paper: Business Statistics- II Code: 4.02

Time: 3 Hours   **Theory Paper Max Marks: 80**
              Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Important: The Examiner will set at least THREE numerical and THREE theoretical questions in the question paper.

Unit – I

Index Numbers:- Meaning, Types and Uses; Methods of Constructing price and Quantity indices (Simple and Aggregate); Tests of adequacy; Chain-base Index numbers, Base shifting, Splicing and Deflating; Problems in constructing index numbers; Consumer price index.

Unit- II

Analysis of Time Series: - Causes of Variations in time series data; Components of a time series.

Decomposition- Additive and Multiplicative models; determination of trend. Moving averages method and method of least squares (Including linear second degree, Parabolic and Exponential trend); Computation of seasonal indices by simple averages, Ratio to Trend, Ratio to moving average and link relative methods.

Unit- III

Theory of Probability: - Probability as a Concept; Approaches to defining probability, Addition and Multiplication laws of probability; Conditional probability, Baye's Theorem.

Unit- IV

Probability Distribution : - Probability distribution as a concept; Binomial, Poisson and Normal Distribution- Their Properties and Parameters.

Suggested Readings:

1. Dr.S.P.Gupta, Statistical methods, S.Chand & Co., New Delhi.

2. D.N.Elhance, Veena Elhance, B.M.Aggarwal, Fundamentals of Statistics, Kitab Mahal.

3. N.P.Aggarwal, Quantitative Techniques, Ramesh Book Depot., Jaipur.

4. R.P.Hooda, Statistics for Business and Economics, Mcmillan India Ltd., New Delhi.

B.Com – II- IVth Semester w.e.f. session 2017-18
Paper: Business Regulatory Framework – II
Code: 4.03

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                        Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit- I

Indian Partnership Act – Nature of Partnership firm; test of partnership; Duties and Rights of partners; Relations of partners to third parties; position of minor in partnership; Reconstitution of a partnership firm; Registration of firm.

Dissolution of firm: - Modes of dissolution; consequences of dissolution of firm; settlement of accounts after dissolution.

Unit- II

Negotiable Instruments Act: - Negotiable Instrument an introduction Promissory notes; Bills of Exchange; cheques, Parties to negotiable Instruments; Discharge of parties from Liability; Dishonour of Negotiable Instruments. Instruments; Presentment of Negotiable Instrument; Negotiation.

Unit- III

Sales of Goods Act: - Introduction; Formation of contract of sale of Goods; conditions and warranties; Transfer of property or ownership; Performance of contract- Delivery and Payment; Rights of unpaid seller; suits of Breach of contract.

Unit- IV

RTI Act : features, rights and importance.

Suggested Readings:

1.   M.C.Kuchhal, Business Laws, Sultan Chand & Co., New Delhi.

2.   N.D.Kapoor, Merchantile Law. Sultan Chand & Co., New Delhi.

3.   Texman

*4.   Resai T.R. **Partnership Ac**t, S.C.Sarkar and Sons, kolkata.*

B.Com – II- IVth Semester w.e.f. session 2017-18
Paper: Corporate Law- II
Code: 4.04

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                     Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit- I

Depository System –meaning and importance; Shares: -; Types of shares; Allotment of Shares;; Transfer and Transmission of shares; Paperless Trading – Benefits and Procedure; Need for educating investors

Unit- II

Share capital: - Meaning and forms of capital; Alteration of share capital; Reduction of share capital;

Further issue of share capital; Rights of pre-emption of shares. Shareholders and Members: -

Difference between Shareholders and members; Modes of acquiring membership; termination of

membership; who may be members? Rights and Liabilities of members.

Unit- III

Meeting of Company: - Essentials of valid meeting; meetings of Shareholders: - Annual general meeting; Extra-ordinary general meeting; meetings of board of
directors; Proxy; Voting, Notice, Agenda and Minutes of meetings. Directors:

- Duties, Powers, Liabilities, Appointment and removal of directors. **Unit- IV**

Winding Up: - Meaning; Winding up by the Tribunal-Petition for winding up; Voluntary winding up; Powers and Duties of company Liquidator, consequences of winding up..

Suggested Readings:

1. Kuchal M.C. **Modern Indian Company Law** *Shri Mahavir Books, Noida.*

2. Kapoor N.D. **Company Law**: *Incorporating the provisions of the companies Amendment Act.*

3. Singh Avtar **Company Law**, *Eastern Book Company, Luckno*

B.Com – II- IVth Semester w.e.f. session 2017-18 Paper: Marketing Management Code: 4.05

Time: 3 Hours   **Theory Paper Max Marks: 80**
                          Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit- I

Introduction: - Nature, Scope, Importance of marketing; Marketing concepts- Traditional and Modern.

Market Segmentation: - Concept, Importance and basis of market segmentation.

Unit- II

Consumer Behavior: - Nature, Scope, Importance, Factors affecting buyer behavior.

Product Planning and Development: - Importance and scope of product Planning in marketing; Stages of New product development.

Product Lifecycle: - Stages of Product life cycle; factors affecting product life cycle.

Unit- III

Branding and Trademark: - Difference between brand and trademark; advantages and criticism of branding; types of branding; Brand Polices and Strategies.

Pricing: - Meaning; Importance, Factors affecting pricing, pricing objectives, Types of price policy and pricing strategies.

Unit- IV

Advertising: - Concept; Importance and criticism of advertising; Media of advertising; Evaluating advertising effectiveness.

Sales Promotion: - Importance, Methods, Functions and Publicity.

Suggested reading:

*1. Kotler Philip **Marketing Management** Prentice Hall of India New Delhi,1986*

*2. Pride Willian M and Ferrel O.C. **Marketing** Houghton-Mifflin Boston*

*3. Stantan W.J., Etzel Michael J. and Walker Bruce J. **Fundamentals of Marketting** MC Graw-Hill,New York.*

B.Com – II- IVth Semester w.e.f. session 2017-18
Optional Paper: Business Ethics
Code: 4.06 (i)

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                     Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I

Thinking conceptually about Politics: Liberty, Equality, Justice, Rights and Recognition, The idea of a good society. Concept of Business Ethics.

Unit-II

Domain of Politics and ethics: Democracy and Welfare State, Market and Globalization. Approaches to

Moral Reasoning: Consequentalism, Deontologism, Teleological reasoning.

Unit-III

Politics and Ethics in Business: Corporate Code of Ethics. a)   Environment

b)   Accountability c)   Responsibility d)   Leadership

e)   Diversity

Corporate Social Responsibility. Arguments For and Against; Strategic Planning and corporate social Responsibility; Corporate Philanthropy.

Unit-IV

Corruption, corporate scandals, whistle blowing, insider trading, discrimination:

Gender Sensitization: Meaning, Definition, Gender Roles, Gender Equality, Gender Differentiation, Crucial Role of Gender Sensitization in Gender Mainstreaming, , Sex Ratio as per Census of India 2011, Role of Government in Gender Sensitization

Suggested Readings:

1.   Dr.F.C.Sharma, Business Values & Ethics – Shree Mahavir Book Depot, Nai Sarak, New Delhi.

2.   C.S.V Murthy – Business Ethics, Himalya Publishing House.

3.   Shina Parkashan – Managerial Ethics – Rajat Publications.

4.   C.L.Dave – Social Accounting – Renuka Publishers, Jodhpur.

B.Com – II- IVth Semester w.e.f. session 2017-18 Optional Paper: Banking and Banking Law
Code: 4.06 (ii)

Time: 3 Hours   **Theory Paper Max Marks: 80**
Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I

Definition of Bank, Commercial Banks-importance, functions and problems of Non-performing Assets, structure of Commercial Banking system in India. Credit Creation: Process of Credit Creation and its Limitations.

Unit-II

Regional Rural Banks, Cooperative Banking in India.

Reserve bank of India: Functions, regulation and control of credit, monetary policy.

Unit-III

Determination and Regulation of Interest Rates in India.

Relationship between banker and Customer, Definition of Customer, General Relationship between banker and customer, obligation of banker, Garnishee order, banker's rights.

Special types of Bankers Customers Minor, Married Women, Illiterate persons, Lunatics, Trustees, Executors and Administrators, Customer's attorney, Joint Account, Joint Hindu family, partnership Firm, Joint stock companies, Clubs, Societies and Charitable Institutions.

Unit-IV

Negotiable Instruments:

Definition of Negotiable instruments, Essential features of Negotiable instruments, holder and Holder in Due course.

Rights and Liabilities of parties for Negotiable instruments:

Capacity of parties: Minor's position, legal representative, Liability of parties, Drawer of Bill or Cheque, Liability of Maker of note & Acceptor of Bill, Liability of endorsed Negotiable Instruments without Consideration, Instrument obtained by Unlawful means.

Endorsements:

Meaning of Negotiation, Definition of Endorsement, Legal provisions regarding Endorsement, General rules regarding forms of endorsement, regular forms of Endorsement, Kinds of Endorsement.

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                                      Internal marks: 20

Note: The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit – I
Secretary : Meaning, definitions, functions, duties, responsibilities, powers, appointment, procedure; qualifications and disqualifications; position and removal of secretary.

Unit – II
Promotion of Company and Secretary: Duties of Secretary regarding formation of M/A and A/A and their alterations. Duties of secretary regarding issue of share certificate, share warrant and share stock, calls–in-arrear, forfeiture and re-issue of shares, transfer and transmission of shares.

Unit – III
Company Meeting & Secretary: Duties of Secretary regarding meetings, requisites of a valid meeting, secretarial duties regarding meetings of shareholders, meetings of Board of directors.

Unit - IV
Company Secretary and motion and Resolution, voting and proxy.

Suggested Readings:-
1. *Company Secretarial Practice – N.D.Kapoor*
2. *Text Book of Company Secretarial Practice – P.K.Ghosh*
3. *Company Law & Secretarial Practice – Dr. M.R.Sreenivasan.*
4. *Company Law Secretarial Practice Manual by – K.R. Chandratre*

B.Com – II- IVth Semester w.e.f. session 2017-18 Optional Paper: Computer :Application of Information Technology in Business-II Code: 4.06 (iv)

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                                          Internal marks: 20

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I

Information System: Information, Information Processing Life Cycle, Methods of data processing, Application of Electronic Data Processing. Need of an efficient Information System, Types of an Information system, Information requirement for Planning, Coordination, and Control for various levels in Business, Industry.

Computer Fundments: Types of Computer, Hardware option-CPU, Input and Output devices, Storage devices, Configuration of Hardware Devices and their applications

Unit-II

Database Fundamentals: Database: Definition, Main Component of Database, DBMS: Architecture of DBMS, Benefits of DBMS, Data Models: Hierarchical, Network and Relational Model, Client-Server Concept.

 Business Data Processing: Data Storage Hierarchy, File Management System: File Types, File Organization Techniques: Direct File, Sequential File and Index Sequential File; DBMS, Role of DBA, Main components of a DBMS: DDL, DML, Query Language and Report Generator, Creating and Using a Database.

Unit-III

Emerging Trends in IT: Introduction, E-Commerce and E-Business, Types of   Electronic Commerce(E-Commerce), Processes in E-commerce, Types of an Electronic Payment System, E-Case, E-Cheque, Credit Card, Advt. and Disadvantages of E-Commerce, Security Schemes of an Electronic Payment Systems, Electronic Fund Transfer, Electronic Data Interchange(EDI), Mobile Communication, Infrared Communication, Smart Card**.**

Unit-IV

Computer Software: Definition, Categories of Software: System Software, Operating System Software, Application Software, Operating System:- Characteristics, Functions of an O.S., Types of an Operating System, System Utilities Programs: Editor, Loader, Linker, File Manager, Operating System as a Resource Manager, Concept of CUI and GUI.

Computer Languages: Definition, Machine Language, Assembly Language, High-Level Language, Compiler, Interpreter, Assembler.

Suggested Books:
1. *Introduction to IT, ITL Education Solutions Limited, Pearson education, 482, F.I.EmPatnarganj, Delhi, India.*
2. *Inf. Technology and Computer fundamental, Dr. Nasib Singh Gill,*
3. *Introduction to Information System:Alexis Leon,McGraw-Hill Education(India) pvt.Ltd. B-4, Sector-63, Dist.Gautam Budh Nagar, Noida, Uttar Pardesh,-201301.*
4. *Computer Networks and Internets: Douglas E.Comerce, Pearson Education.*

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                          Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Important: The Examiner will set at least THREE numerical and THREE theoretical questions in the question paper.

Unit-I
Income Tax: An introduction and Important Definitions, Agriculture Income, Residential status and incidence of Tax Liability, Exempted incomes.

Unit-II
Income from Salaries (including retirement benefits); Income from House property.

Unit-III
Profits and Gains from Business or Profession; Depreciation; Capital Gains.

Unit IV
Income from other sources, clubbing of incomes & aggregation of incomes, set off and carry forward of losses, Deductions to be made in computing total income.

Suggested Readings:
1. *Income Tax Law and Accounts- Dr. Parveen Gupta, Dr.N.K.Garg and R.K.Tyagi, SBPD Publishing House, Agra*
2. *Direct Taxes law & Practice – Dr. H.C.Mehrotra & Dr. S.P. Goyal, Sahitya Bhawan Publications, Agra.*
3. *Direct Taxes law & Practice – Dr. Bhagwati Prasad – Wishwa Prakashan, N.Delhi.*
4. *Simplified Approach to income Tax: Dr. Girish ahuja & Dr. Ravi Gupta – Sahitya Bhawan Publishes & Distributors, Agra.*

B.Com.III Pass Vth Sem w.e.f. from 2017-18
Paper: Cost Accounting – I
Code: 5.02

Time: 3 Hours   **Theory Paper Max Marks: 80**
Internal marks: 20

Note: The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Important: The Examiner will set at least THREE numerical and THREE theoretical questions in the question paper.

Unit-I

Cost Accounting : Meaning, Features, Scope, Techniques, Methods, Objectives, Importance and Limitations. Costing; cost accountancy; cost centres and profit centres, Difference and similarities of cost accounting system with financial accounting system. Cost: main elements and types.

Material Control: Meaning and objectives of material control, material purchase procedure, fixation of inventory levels- reorder level, Minimum level, Maximum level, Danger level. EOQ analysis. Methods of Valuing Material Issues. Wastage of material – main types.

Unit – II

Labour Cost Control : Importance, methods of time keeping and Time Booking; Treatment and control of Labour Turnover, Idle Time, Overtime, Systems of Wage Payment-Time Wage System, Piece Wage System. Incentive Wage plans – Individual plans and group plans.

Unit – III

Overheads : Meaning and Types. Collection, Classification; Allocation, Apportionment and Absorption of Overheads – Main methods.

Unit – IV

Unit and output costing : meaning and objectives; cost sheet – meaning, Performa, types preparation of cost sheet; determination of tender price; production account – types. Reconciliation of cost and financial accounts : Meaning. Objectives and procedure.

Suggested Readings:-
1. S.P. Iyengar – Cost Accounting, Sultan Chand & Sons, Educational Publishers, New Delhi.
2. Jain & Narang – Cost Accounting – Principles and Practice Kalyani Publishers, Ludhiana.
3. Maheshwari and Mittal – Cost Accounting – Sh. Mahavir Book Depot, Delhi.

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                               Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Important: The Examiner will set at least THREE numerical and THREE theoretical questions in the question paper.

Unit – I
Management Accounting: Nature and Scope of Management Accounting: Meaning, functions, Scope of Management Accounting, The Management Accountant, The Controller, The Treasurer, Management Accounting Principles, Management Accounting vs Financial Accounting vs. Cost-Accounting, Utility of management Accounting, Limitations of Management Accounting, Tools of Management Accounting.

Unit – II
Analysis and Interpretation of Financial Statements: meaning and types of financial statements, analysis and interpretation of financial statements, Types of financial analysis, steps involved in financial analysis, techniques of financial analysis. Ratio Analysis : meaning of ratios, classification of ratios, profitability ratios, balance sheet ratios and turnover rations, advantages and limitations of ratio analysis.

Unit – III
Cash Flow Statement : Meaning, objectives, limitations and accounting procedure; Financial planning

Unit – IV
Capital Budgeting : Meaning, nature, need, importance, appraisal methods, capital rationing.

Suggested Readings
1. *1.J.K.Aggarwal, R.K.Aggarwal, M.L.Sharma – Accounting for Managerial Decisions – Ramesh Book Depot., Jaipur.*
2. *2.R.Kishore – Advance Management Accounting – Taxamn allied Services Pvt. Ltd.*
3. *3.M.Y.Khan, P.K.Jain – Management Account – Tata Mcgraw Hill.*
4. *4.Morngren, Sundem, Stratton – Introduction to Management Accounting - Pearson Accounting*
5. *5.S.N.Mittal – Accounting & Financial Management – Shree Mahavir Book Depot, Nai Sarak, New Delhi.*

B.Com.III Pass Vth Sem w.e.f. from 2017-18
Paper: Financial Market Operations
Code : 5.04

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                              Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit – I

Money Market: Indian Money Markets Composition Composition and Structure; (a) Acceptance houses (b) Discount houses and (c) Call money market; Recent trends in Indian money market.

Capital Market : Security market- (a) New Issue Market (b) Secondary market; functions and role of stock exchange listing, procedure and legal requirements Public issue pricing and marketing, Stock exchange – National Stock Exchange and over the Counter exchangers.

Unit – II

SEBI – Introduction, Role, Its powers, Objectives, Scope & Functions.

Investors Protection:- Grievances concerning stock exchange and dealings and their removal; grievance cell in stock exchange SEBI: Company law Board: Press remedy through

courts. **Unit - III**

Functionaries on stock exchanges:- Brokers, Sub brokers, Market makers, Jobbers, Portfolio Consultants, Institutional Investors, Depository.

Financial Services:- Merchant Banking – Functions and Roles; SEBI guidelines; credit rating – concept, functions, and types.

Unit – IV

Role, Policy measures relating to Development Financial Institution in India. Products & Services offered by IFCI, IDBI,IIBI, SIDBI, IDFCL, EXIM, NABARD & ICICI.

Meaning and benefits of mutual funds, types, SEBI guidelines.

Suggested Readings:
1.   *Chandler M.V. and Goldfield S.M.: Economics of Money and Banking & Harper & Row Newyork.*
2.   *Gupta Sural b: Monetary Planning in India: Oxford, Delhi.*
3.   *Gupta Sural b: Monetary Economics: S.Chand & Co. New Delhi.*
4.   *Bhole L.M.: Financial Market Institutions; Tata Mc Graw-Hill, New Delhi.*
5.   *Hooda, R.P,: Indian Securities Markets- Investors View Point; Excell Books, New Delhi.*

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                                  Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit – I

Entrepreneur-Entrepreneurship-Enterprise: Conceptual issues. Entrepreneurship vs. Management. Roles and functions of entrepreneurs in relation to the enterprise and in relation to the economy. Entrepreneurship as a interactive process between the individual and the environment. Small business as the seedbed of entrepreneurship. (The teachers should emphasize to students the desirability as well as feasibility of a career in entrepreneurship in the Indian scenario.) Entrepreneurial competencies. Entrepreneurial motivation, performance and rewards. (The teachers may make use of

Entrepreneurship Development Institute of India's Inventory of Entrepreneurial Competencies and National Institute of Entrepreneurship and Small Business Development's training kit for arousing entrepreneurial motivation and capacity and capability building).

Unit – II

Opportunity scouting and idea generation: role of creativity & innovation and business research. Sources of business ideas. Entrepreneurial opportunities in contemporary business environment, for example opportunities in network-marketing, franchising, business process outsourcing in the early 21st century. (The students be advised to visit various product/service franchisees, BPO concerns and meet up/down links in the Network Marketing.) The process of setting up a small business: preliminary screening and aspects of the detailed study of the feasibility of the business idea and financing/non-financing support agencies to familiarize themselves with the policies/programmes and procedures and the available schemes.) Preparation of Project Report and Report on Experiential Learning of successful/unsuccessful entrepreneurs. (The students may be advised to develop a structured instrument (questionnaire) for conducting survey of the various aspects of entrepreneurs/enterprise. They may also be advised to prepare a comprehensive business plan. The desirability and feasibility of liaison with relevant funding/non-funding agencies may also be explored.) **Unit – III**

Managerial roles and functions in a small business. Designing and redesigning business processes, location, layout, operations planning & control. Basic awareness of the issues impinging on quality, productivity and environment. Managing business growth. The pros and cons of alternative growth options: internal expansion, acquisitions & mergers, integration & diversification. Crises in business growth.

Unit – IV

Issues in small business marketing. The concept and application of product life cycle (ptc), advertising & publicity, sales & distribution management. The idea of consortium marketing, competitive bidding/tender marketing, negotiation with principal customers. The contemporary perspectives on Infrastructure Development, Product and Procurement Reservation, Marketing Assistance, Subsidies and other Fiscal & Monetary Incentives. National, state level and grass-root level financial and nonfinancial institutions in support of small business development.

Suggested Readings:

Suggested Readings Books:
1. Brandt, Steven C., The 10 Commandments for Building a Growth Company,
Third Edition, Macmillan Business Books, Delhi, 1977
2. Bhide, Amar V., The Origin and Evolution of New Businesses, Oxford
University Press, New York, 2000.
3. Desai, Vasant, Small Scale Enterprises Vols. 1-12, Mumbai, Himalaya
Publishing House. (Latest edition).
4. Dollinger, Mare J., Entrepreneurship: Strategies and Resources, Illinois,
Irwin, 1955.
5. Holt, David H., Entrepreneurship: New Venture Creation, Prentice-Hall of India, New Delhi, latest Edition.
6. Panda, Shiba Charan, Entrepreneurship Development, New Delhi, Anmol
Publications. (Latest Editions)
8. SIDBI Report on Small Scale Industries Sector (Latest Editions)

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                     Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit – I
International Business:- An overview; Domestic business; International Business; Major risks and challenges of International Business; International Business Environment – Components and determinants; stages of internationalization of business; international business approaches, concept of globalization.

Unit – II
Modes of entering into international business; nature of multinational enterprise and international direct investment; foreign exchange; determination of exchange rate; Balance of payments.

Unit – III
Theories of International Trade : Absolute advantage theory; comparative advantage theory; factor proportions theory; product life cycle theory of trade; government influence on trade; rationale for government intervention, instruments of trade control; role of WTO, IMF and World Bank in International trade.

Unit – IV
Assessing International markets; designing products for foreign markets branding decisions; International promotions policy; international pricing; international logistics and distribution

Suggested Readings:
1. *International Business : Francis Cheruniliam (Himalaya Publishing House)*
2. *International Trade and Export Management: Francis Cherunilam (Himalaya Publishing House)*
3. *International Business: Dr. P. SubbaRao (Himalaya Publishing House)*
4. *International Trade: Raj Aggarwal (Excel Publication)*

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                          Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I

Investment: Meaning, nature and process. Investment avenues and alternations, concept and Measurement of Investment risk and return; Identification of Investment Opportunities; Speculation, Gambling and Investment activities.

Unit-II

Efficient Market theory or Hypothesis. Technical Analysis: Dow theory, Charting techniques, volume indicators.

Unit-III

Fundamental Analysis: Company Analysis, Industry Analysis and Economy Analysis, Technical v/s Fundamental analysis.

Unit-IV

Secondary Market : Stock Exchanges, Online Trading.

Trading mechanism in Bombay Stock Exchange. Derivatives: Meaning, uses, Types, Derivatives in Indian capital market.

Option Contracts: Meaning uses, Types (Elementary Introduction).

Suggested Readings:-
1. *P. Pandian- "Security Analysis & Portfolio Management" Vikas Publishing house, New Delhi.*
2. *V.K.Bhalla -" Investment Management" S. Chand & Sons, New Delhi.*
3. *Fisher & Jordon – " Security Analysis & Portfolio Management)*
4. *Prasanna Chandra- "Investment Analysis & Portfolio Management.*

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                         Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit – I
Introduction of E-Commerce:- Definition, Main activities of E-Commerce Benefits of E-Commerce, E-Commerce Applications, E-Commerce systems, Advantages and disadvantages of E-Commerce, E-Commerce Technologies, Types of E-Commerce: B2B, B2C, C2B, B2G,G2C, Mobile commerce, E-Commerce and the Trade cycle, E-Markets, Future of E-Commerce Introduction to Portals: Functions of Portals, Advantages of Portals, Market place for E-Commerce, E-Commerce Portals, Types of Portals.

Unit – II
Business to Business Electronic Commerce: Inter organization Transactions, Introduction to Electronic Market, Online Shopping, Online Purchasing, Models of Electronic Market, Markets Category, E-Business, B2B E-Commerce, B2B application, B2B Electronic Commerce requirements, Virtual Supply Technologies, Electronic Applications Categories, Electronic Tailing, E-Tailing in India, Auctions and the Emerging Electronic market place, Essential Elements of an Electronic Business, Differentiation in Catalogs for B2B as opposed to B2C, Instant Messaging. Electronic Date interchange (EDI): Definition, Benefits of EDI, Applications of EDI.

Unit –III
Business to Commerce electronic commerce: Definition, e-shop, Internet Shopping and the Trade cycle, Advantages and disadvantages of consumer e-Commerce. **Electronic Payment Systems**: Introduction, Traditional Payment Systems, Modern Payment system: PC Banking, Credit cards, Electronic Cheque, Micro payments, Smarts cards, E-cash, EFT. **Security Schemes**: Encryptions, Digital Signatures, Security Certificates, Protocols used in Internet Security; Secure Socket Layer (SSL), Secure Hypertext Transfer Protocal (SHTP), Secure Electronic Transaction (SET), e-Commerce, I.T.Act. 12

Unit – IV
E-Banking/ Online Banking: Introduction, Advantages of Online Banking, issues in Internet Banking, Tools of Financial Banking, E-Banking Risks, e-Commerce and Internet: Definition, e-Commerce Technical components: Web resources, ISP, Cookies; Evolution of the Internet, Internet for Business, TCP/IP and OSI Model protocol, Broad Band Technology. Supply chain management; Definition, Different categories of supply chain, Functions of SCM, Benefits of SCM;

Books suggested
1. e-Commerce, CSV, Murthy, Himalaya Publishing House.
2. e-Commerce, Keunth. L. Landon, Pearson Education.
3. e-Commerce, Renu Gupta, Mahavir Publications.
4. e-Commerce, David Whiteley, Tata Mco-raw-Hill.

B.Com.III Pass Vth Sem w.e.f. from 2017-18
Optional Paper: International Business Environment
Code : 5.06 (iv)

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                     Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit – I
Recent global trends in international trade and finance; dimensions and modes of IB; structure of IB environment; risk in IB; motives for internationalization of firms; organizational structure for IB; world trading system and impact of WTO; exchange rate systems; global financial system; barriers to IB; international business information and communication.

Unit – II
Foreign market entry strategies; country evaluation and selection; factors affecting foreign investment decisions; impact of FDI on home and host countries; types and motives for foreign collaboration; control mechanisms in IB.

Unit – III
Decisions concerning global manufacturing and material management; outsourcing factors; managing global supply chains; product and branding decisions; managing distribution channels; international promotion mix and pricing decisions; counter trade practices; mechanism of international trade transactions.

Unit – IV
Harmonizing accounting difference across countries; currency translation methods for consolidating financial statements; the LESSARD-LORANGE Model; cross cultural challenges in IB; international staffing decisions; compensation and performance appraisal of expatriate staff; ethical dilemmas and social responsibility issues.

Suggested Readings:
1. Daniels, J.D. and H. LEE Radesbaugh, International Business-Environment and Operation (New Delhi; Pearson Education).
2. Hill, Charles W.L., International Business – competency in the Global marketplace (New Delhi: Tata McGraw Hill).
3. Sundram, Anant K and steward J Black, The International Business environment: Text and Cases (New Delhi: Prentice Hall of India).
4. Sharan, V., Internatioal Business: Concept, Environment and strategy (New Delhi: Person Education)
5. Beth V. Yarbrough and Robert H.Yarbrough, The World Economy – Trade and Finance, Thomson Leaning, Singapore

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                    Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Important: The Examiner will set at least Two numerical questions in the question paper.

Unit – I

Rebate & Relief of Tax, computation of Total income and Tax liability of individuals. Filling and Filing of return (ITR – I and II)

Unit – II

Assessment of Hindu Undivided Families, Assessment of Firms & Association of Persons.

Unit – III

Income Tax authorities & their powers; procedure for assessment; Deduction of Tax at Source (TDS); advance payment of tax.

Unit – IV

Recovery & refund of tax; appeals & revision; penalties, offences & prosecutions.

Suggested Readings:
1. *Income Tax Law and Accounts- Dr. Parveen Gupta, Dr.N.K.Garg and R.K.Tyagi, SBPD Publishing House Agra*
2. *Direct Taxes Law & Practice : Dr. H C Mehrotra & Dr. S P Goyal, Sahitya Bhawan Publications,Agra.*

4. *Direct Taxes Law & Practice : Dr. Bhagwati Prasad, Wishva Prakashan, New Delhi*
5. *Simplified Approach to Income Tax : Dr. Girish Ahuja & Dr. Ravi Gupta – Sahitya Bhawan Publishes & Distributors, Agra*

B.Com.III Pass VIth Sem w.e.f. from 2017-18
Paper: Cost Accounting -II
Code: 6.02

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                      Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.
Important: The Examiner will set at least THREE numerical and THREE theoretical questions in the question paper.

Unit – I

Process Costing : Meaning; Uses; Preparation of process account, Treatment of Normal Wastage, Abnormal Wastage, Abnormal Effectiveness; Treatment of opening and closing stock (Excluding Work in Progress): Joint - Product and By - Product: Main methods of apportionment of Joint cost. Inter process profits.

Unit – II

Contract Costing – meaning, main features, preparation of contract account, Escalation clause; contract near completion; cost plus contract. Job and batch costing.

Unit- III

Budgetary control – meaning of budget and budgetary control, budgetary control as a management tool, limitations of budgetary control, forecasts and budgets, installation of budgetary control system, classification of budgets, fixed and flexible budgeting, performance budgeting, zero based budgeting and responsibility accounting.

Standard Costing : meaning, limitations, standard costs and budgeted costs, determination of standard cost, cost variances, direct material and direct labour only.

Unit – IV

Marginal Costing and Profit planning: Marginal costing, Absorption costing, Marginal cost, Cost volume Profit analysis, BEP Analysis, Key factor, BE chart, angle of incidence, concept of decision-making and steps involved, determination of sales mix, make or buy Decisions.

Suggested Readings:-
1. S.P. Iyengar – Cost Accounting, Sultan Chand & Sons, Educational Publishers, New Delhi.,
2. Jain & Narang – Cost Accounting – Principles and Practice Kalyani Publishers, Ludhiana.,
3. Maheshwari and Mittal – Cost Accounting – Sh. Mahavir Book Depot, Delhi.

B.Com.III Pass VIth Sem w.e.f. from 2017-18
Paper : Financial Management
Code: 6.03

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                         Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Important: The Examiner will set at least THREE numerical and THREE theoretical questions in the question paper.

Unit – I
Nature of Financial Management : Scope of Finance, Finance functions, Financial Manager's role, Financial goal; Profit maximization Vs Wealth maximization, Objective of financial Management, Finance and related disciples, Financial planning
Unit – II
Working Capital Management : Meaning, nature and planning of Working Capital. Permanent and variable Working Capital. Balanced working position, determinates of working Capital, Issues of working Capital Management. Management of cash and Marketable Securities and Receivables Management.
Unit –III
Cost of capital : Significance and determination, capitalisation;
leverage analysis: operating, financial and composite leverage: EBIT-EPS Analysis**.**
Units – IV
Capital structure theory and policy: Relevance of capital structure; Net income and traditional views, Irrelevance of capital structure; NOI Approach and the MM Hypothesis without taxes, capital structure planning and policy.
Dividend Theory and Policy : Issues in dividend policy, Walter's and Golden's model of dividend relevance objections of dividend policy, considerations in dividend policy, stability of dividends, forms of dividend.

Suggested Readings:-
1. *Financial Management Accounting by : I.M.Pandey, Vikas Publications House New Delhi.*
2. *Financial Management Accounting by Khan & Jain, Tata Mc Graw Hill, Publications New Delhi.*

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                               Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit – I
Auditing : Meaning, objectives, importance and types of Auditing.
Audit Process: internal control, internal check & internal audit, audit programmer.

Unit – II
Audit Procedure : Routine checking, vouching, verification & valuation of assets & liabilities.

Unit – III
Audit of Public Company : Qualification, Appointment of company Auditors, their powers, duties and liabilities, Audit of depreciation and reserves, Divisible profits & dividends

Unit – IV
Audit Report and Investigation
Audit Report : Meaning, objectives, contents and types.
Investigation : Meaning, Nature and objectives.

Suggested Readings:
1. Sharma T.R. Principles of Auditing Sahitya Bhawan, Agra.
2. Tondon B.N. Principles of Auditing, S. Chand and Co., New Delhi.
3. Gupta Kamal contemporary Auditing Tata Mc Graw hill, New Delhi.

Time: 3 Hours
Theory Paper Max Marks: 80
Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Goods and services tax (GST):

Unit – I
Introduction: - Salient feature of GST, Benefit of GST, Constitutional Framework of Goods and Services tax, concept of GST; Important definitions; Supply under GST:- Meaning and scope of supply including composite and mixed supply ; levy and collection including reverse charge mechanism, Tax on electronic commerce operator (ECO); Exemption from GST; Composition levy;

Unit – II
Place of Supply:- Within state/Union territory, Interstate, Import and export; Time of Supply of goods and services; Value of supply including valuation rules; Input tax credit:- Eligibility and conditions for taking Input Tax Credit, Apportionment of credit and blocked credit, ITC in case of banking company and financial institutions, ITC availability in special circumstances, Reversal of ITC on switching to composition levy or exit from tax-paying status, Transfer of ITC on account of change in constitution of registered person, Input service distributors;

Unit – III
Registration; Issue of invoices:- tax invoice, revised tax invoice, credit note, debit note, bill of supply, receipt voucher, refund voucher, payment voucher, invoices in special cases. ; E-way bill; Payment of Taxes; Returns; Job work; Provision of TDS and TCS; Record keeping, Assessment and Audit;

Customs Act 1962:
Unit – IV
Customs duty: Important definitions, types, importance, documents required for import and export procedure : Export Promotion Scheme.

Suggested reading:-
1. *The Central Goods and Services Tax Act, 2017.*
2. *The Integrated Goods and Services Tax Act, 2017.*
3. *The Union Territory Goods and Services Tax Act, 2017.*
4. *Custom Act, 1962*
5. *Goods and Services Tax- Parveen Gupta and R.K. Tyagi, SBPD Publishing House, Agra*
6. *GST and Custom Law- Anoop Modi and Mahesh Gupta, SBPD Publication, Agra*
7. *Goods and Services Tax including Customs Duty Act- Prof. C.K. Shah and Prof. S.K. Mangal, RBD Publishing House, Jaipur*
8. *Goods and Services Tax (GST) – Dr. H.C. Mahrotra and Prof. V.P. Aggarwal, Sahitya Bhawan Publications.*

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                           Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit – I
International Marketing:
Nature and Concept; Domestic Vs International Marketing; Opportunities and Challenges for marketing in International Environment ; Foreign market selection and entry modes.

Unit – II
Product Planning and Pricing:
International product life cycle research and informations; Product designing and packaging; Pricing process and methods; International price quotations and payment terms.

Unit – III
International Distribution:
 Channel structure and selection decisions; Managing channel conflicts; Selection and appointment of foreign sales agents; Basic export procedure and documentation.

Unit – IV
Product Promotion:
Methods of International product Promotion; challenges in International advertising and media strategy; Web marketing; Organising trade fairs and exhibitions.

Suggested Readings:
1. *Bhattacharya R.L and Varshney B: International Marketing Management: Sultan Chand, New Delhi.*
2. *Keegan W.J, Multinational Marketing Management, Prentice Hall, New Delhi.*
3. *Kotler Phillip: Moder Mott M.C: The Essence of International Business, Prentice Hall, New Delhi.*
4. *Caterora P.M. and Keavenay S.M: Marketing and International Perspective, Ervind Homewood Illinois.*

B.Com.III Pass VIth Sem w.e.f. from 2017-18
Optional Paper : Fundamentals of Operations Research
Code: 6.06 (ii)

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                                     Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit – I
Basics of Operational Research – Development, Definition Charactertics, Necessity, Scope, Limitation.
Linear Programming - Introduction, Application, Formulation of Linear Programming Problem, General Linear Programming Problem, Graphical Method of Solution. Theory of Simplex method, Big-M Method, Integer Programming.

Unit – II
Transportation Model - Assumption, Formulation and Solution of transportation Models, Trans-Shipment Problems, Definition of Assignment Model, Hungarian Method for solution of Assignment Problems. Travelling Salesman problem.

Unit – III
Queuing Models – Application, Introduction, Elements, operating Characteristics, Waiting Time and Idle Time Costs, Model I – Single Channel poison Arrivals with Exponential Service Times. Infinite Population; Assumption & Limitation Poisson of Queuing Model.
Game Theory – Theory of Games, Charactertics of Games, Rules – Look for a pure Strategy, Reduce Game by Dominance, Mixed Strategies (2 x 2 Games, 2 x n Games or m x 2 Games).

Unit – IV
Simulation : Introduction- Meaning, Advantage, Limitation, Application, When to use Simulation? Monte Carlo Simulation, Generation of Random numbers.
Net Work Analysis in Project Planning: Project, Project Planning scheduling, CPM, PERT, Cost Analysis and Crashing the Network Exercises.

Suggested Readings:
1. Hien, L.W.: Quantitative approach to Managerial decisions, Prentice hall, New Jesercy. India, Delhi.
2. Lawrence B. Morse: Statistics for Business & Economics, Harper Collins.
3. Levin, Richard I and David S Rubin: Statistics for management, Prentice hall of India, Delhi.
4. Watsnam Terry J. and Keith Parramor: Quantitative Methods in Finance, International Thompson Business Press.
5. Ackaff, R.L. and Sasieni, M.W., Fundamentals of Operations Research, John Wilely and Sons Inc., New york 1986.

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                    Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit – I
E-Commerce : History of E-Commerce, Types of E-Commerce; B2B Business Models, B2 C Business models, M-Commerce; Business Models in Emerging E-Commerce Areas; Applications in E-Commerce, E-Commerce in Service Industry, Retail E-Commerce, E-Commerce in Financial Services, E-Commerce and shopping, E-Commerce Travel and Tourism, Internet Shopping, Future of E-Commerce.

Unit – II
Technology Infrastructure for E-Commerce: Internet key Technology Concepts, Switching Techniques,TCP / IP, IP Address, Domain names Service, URL, Client / Server Computing; Internet Protocal- HTTP, E-Mail Protocals, FTP, and SSL, WWW, Internet and the Web features; Internets and extranets: Role of Internets in B2B Applications, Access to Internets and Extranets , Application Extranet, Virtual Private Network (VPN), Firewall, Web Browser, Elements of Networking.

Unit – III
The Elements of e-Commerce: elements, e-visibility, e-shop, online payments, Delivering the goods, After-sales service, Internet e-Commerce security, A Website Evaluation Model. e-Business; Introduction, Internet Bookshops, Grocery Supplies, Software Supplies and Support Electronic, Newspaper Internet Banking, Virtual Auctions, Online share dealing, e-Diversity, Benefits of Auctions, Types and Examples of on-line Auctions.

Unit – IV
Customer Relationship Management: Introduction need of an electronic CRM, CRM's Goal, E- CRM Applications, CRM in Indian Banking, Technology use in CRM; E-Commerce marketing Communications; Online advertising, Display Ads, Search engine Advertising, Sponsorships, E-Mail marketing, Online Catelogs, Social Network, Offline adverting, Website as a marketing Communication Toll, Retail Sector; Advantages and Challenges to online Retail.

Books suggested :
1.   e-Commerce, CSV, Murthy, Himalaya Publishing House.
2.   e-Commerce, Keunth. L. Landon, Pearson Education.
3.   e-Commerce, David Whiteley, Tata Mco-raw-Hill.

Time: 3 Hours   **Theory Paper Max Marks: 80**
                                                     Internal marks: 20

Note:- The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit – I

Concepts of Tax Planning, Tax Evasion, Tax Avoidance, Tax Management Feature of Tax Planning, Need for Tax planning, Precautions in Tax planning, Limitations of Tax planning, Difference between Tax planning, Tax evasion, Tax avoidance, Tax Management.

Unit – II

Tax planning in relation to residential status and non-residents Tax-planning in relation to Employees remuneration: Tax planning for employer, Tax planning for employees. Tax Planning in relation to income from House Property Tax planning in relation to income from Business & profession.

Unit – III

Tax planning in relations to income from capital gains and other sources. Tax planning in relation to individuals and H.U.Fs.

Unit –IV

Tax planning in relation to partnership firms, Body of Individuals or Associations of Persons. Tax planning in relation to setting up of a new business: Nature and Size of Business, location of Business.

Suggested Readings:

1.   Direct Taxes Law & Practice – Dr.H.C.Mehrotra & Dr.S.P.Goyal Sahitya Bhawan Publications, Agra.
2.   Corporate Tax Planning & management – Dr.H.C.Mehrota and Dr.S.P.Goyal – Sahitya Bhawan Publications, Agra.
3.   Direct Taxes & Practice – Dr.V.K.Singhania Taxman's Pulications.
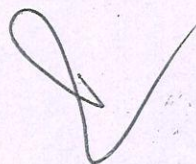
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SCHEME OF EXAMINATION
B.Sc. (PASS COURSE) PHYSICS Semester I – II w.e.f. 2016-17

Semester I

Paper No.	Paper Code	Name of the paper	Max. marks	IA	Time
Paper I	PHY-101	Mechanics	45	10	3 Hrs.
Paper II	PHY-102	Electricity and Magnetism	45	10	3 Hrs.
Paper III	PHY-103	Practical	40	-	3 Hrs.

Semester II

Paper No.	Paper Code	Name of the paper	Max. marks	IA	Time
Paper I	PHY-201	Properties of Matters, Kinetic Theory and Relativity	45	10	3 Hrs.
Paper II	PHY-202	Electro-magnetic Induction and Electronic Devices	45	10	3 Hrs.
Paper III	PHY-203	Practical	40	-	3 Hrs.

B.Sc. (PASS COURSE) PHYSICS Semester III – IV w.e.f. 2017-18

Semester III

Paper No.	Paper Code	Name of the paper	Max. marks	IA	Time
Paper I	PHY-301	Computer Programming Thermodynamics	45	10	3 Hrs.
Paper II	PHY-302	Optics- I	45	10	3 Hrs.
Paper III	PHY-303	Practical	40	-	3 Hrs.

Semester IV

Paper No.	Paper Code	Name of the paper	Max. marks	IA	Time
Paper I	PHY-401	Statistical Mechanics	45	10	3 Hrs.
Paper II	PHY-402	Optics- II	45	10	3 Hrs.
Paper III	PHY-403	Practical	40	-	3 Hrs.

B.Sc. PHYSICS
SCHEME OF EXAMINATION

Semester-I

Paper I- PHY 101 : MECHANICS

Max. Marks : 45
Internal Assessment : 10
Time : 3 Hrs.

NOTE :
1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

Unit I

Mechanics of single and system of particles, conservation of laws of linear momentum, angular momentum and mechanical energy, Centre of mass and equation of motion, constrained motion, degrees of freedom.

Unit II
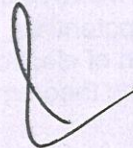
Generalised coordinates, displacement, velocity, acceleration, momentum, force and potential. Hamilton's variational principle , Lagrange's equation of motion from Hamilton's Principle. Linear Harmonic oscillator, simple pendulum, Atwood's machine.

Unit III

Rotation of Rigid body, moment of inertia, torque, angular momentum, kinetic energy of rotation. Theorems of perpendicular and parallel axes with proof. Moment of inertia of solid sphere, hollow sphere, spherical shell, solid cylinder, hollow cylinder and solid bar of rectangular cross-section. Acceleration of a body rolling down on an inclined plane.

References
1. Classical Mechanics by V.K.Jain (Ane 2009)
2. Classical Mechanics by H. Goldstein (2nd Edition)
3. Berkeley Physics Course, Vol. I, Mechanics by E.M. Purchell

B.Sc. PHYSICS

Paper II- PHY 102 : ELECTRICITY AND MAGNETISM

Max. Marks : 45
Internal Assessment : 10
Time : 3 Hrs.

NOTE :

1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

Unit I

Mathematical Background : Scalars and Vectors, dot and cross product, Triple vector product, Scalar and Vector fields, Differentiation of a vector, Gradient of a scalar and its physical significance, Integration of a vector (line, surface and volume integral and their physical significance), Gauss's divergence theorem and Stocks theorem.

Electrostatic Field : Derivation of field E from potential as gradient, derivation of Laplace and Poisson equations. Elecotric flux, Gauss's Law and its application to spherical shell, uniformly charged infinite plane and uniformity charged straight wire, mechanical force of charged surface, Energy per unit volume.

Unit II

Magnetostatistics : Magnetic Induction, magetic flux, solenoidal nature of Vector field of induction. Properties of B (i) $\nabla.B = 0$ (ii) $\nabla xB = J$. Electronic theory of dia and para magnetism (Langevin's theory). Domain theory of ferromagnetism. Cycle of Magnetisation - Hysteresis (Energy dissipation, Hysteresis loss and importance of Hysteresis curve).

Unit III

Electromagnetic Theory : Maxwell equation and their derivations, Displacement Current. Vector and scalar potentials, boundary conditions at interface between two different media, Propagation of electromagnetic wave (Basic idea, no derivation). Poynting vector and Poynting theorem.

References :

1. Electricity and Magnetism by Reitz and Milford (Prentice Hall of India)
2. Electricity and Magnetism by A.S. Mahajan and A.A. Rangwala (Tata McGraw Hill).

B.Sc. PHYSICS
Paper III Phy- 103
PRACTICALS

Max. Marks : 40
Time : 3 Hrs.

SPECIAL NOTES

1. Do any eight experiments .
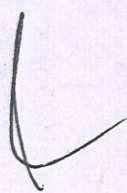2. The students are required to calculate the error involved in a particular experiment (percentage error).

NOTE

1. **Distribution of Marks :**

Experiment :	= 20 marks
Viva Voce :	= 10 marks
Lab Record :	= 10 marks
Total	= 40 marks

For giving marks under Lab. Record each college will maintain practical assessment record by using the following procedure :-

1. Each student has to perform a minimum number of experiments prescribed in the syllabus.

2. After the completion of a practical the teacher concerned will check the note-book and conduct the viva-voce of each student to find out how much concepts related to the theoertical and experimental part of the experiment he/she has understood. According to his/her performance marks will be recorded in their practical note book. These marks will constiue the lab record.

3. To complete the final marks for lab. record a separate register for each class of B.Sc will be maintained. The Student will be assigned a separate page on the register. On this page the marks obtained by the student in different practicals will be recorded. While taking the final average the total marks obtained willbe divided by the total no. of required practicals, instead of the number of practicals performed by the student. This record will be signed by the concerned teacher.

4. The lab. record register will be presented to the external practical examiners for lab. record marks. The external examiners will verify the record randomly.

B.Sc. PHYSICS
Paper III- PHY 103
PRACTICALS

Max. Marks : 40
Time : 3 Hours

Note: Do eight experiments, selecting four from each section.

Section A
1. Moment of Inertia of a fly-wheel
2. M.I. of an irregular body using a torsion pendulum.
3. Young's modulus by bending of beam.
4. Viscosity of water by its flow through a uniform capillary tube.
5. Mechanical equivalent of Heat by Callender and Barne's method.

Section B

1. E.C.E. of hydrogen using voltameter.
2. Calibration of thermocouple by potentiometer.
3. Frequency of A.C. mains and capacity by electrical vibrator.
4. Inductance (L) by Anderson Bridge (A.C. method)
5. To draw forward and reverse bias characteristics of a semiconductor diode.
6. Zener Doide voltage regulation characteristics.
7. To study the characteristics of a solar cell.

B.Sc. PHYSICS
SCHEME OF EXAMINATION

Semester-II

Paper I- PHY 201 : PROPERTIES OF MATTER, KINETIC THEORY AND RELATIVITY

Max. Marks : 45
Internal Assessment : 10
Time : 3 Hrs.

NOTE :
1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

Unit - I
Properties of Matter (Elasticity) : Elasticity, Hooke's law, Elastic constants and their relations, Poisson's ratio, torsion of cylinder and twisting couple. Bending of beam (bending moment and its magnitude) cantilevers, Centrally loaded beam.
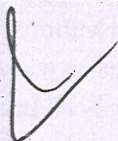
Unit - II
Kinetic Theory of Gases : Assumptions of Kinetic Theory of gases, Law of equipartition of energy and its applications for specific heats of gases. Maxwell distribution of speeds and velocities (derivation required), Experiomental verification of Maxwell's Law of speed distribution : most probable speed, average and r.m.s. speed, mean free path. Transport of energy and momentum, diffusion of gases. Brownian motion (qualitative), Real gases, Van der Waal's equation.

Unit - III
Theory of Relativity : Reference systems, inertial frames, Gallilean invariance and Conservation laws, Newtonian relativity principle, Michelson - Morley experiment : Search for ether. Lorentz transformations length contraction, time dilation, velocity addition theorem, variation of mass with velocity and mass energy equivalence.

References
1. Properties of Matter by D.S. Mathur.
2. Heat and Thermodynamics (Vth Edition) by Mark W. Zemansky.
3. Berkeley Physics Course, Vol.-I Mechanics by E.M. Purchell.

B.Sc. PHYSICS

Paper II- PHY 202 : ELECTRO MAGNETIC INDUCTION AND ELECTRONIC DEVICES

Max. Marks : 4 5
Internal Assessment : 1 0
Time : 3 Hrs.

NOTE :
1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

Unit I

Electromagnetic Induction : Growth and decay of current in a circuit with (a) Capacitance and resistance (b) resistance and inductance (c) Capacitance and inductance (d) Capacitance resistance and inductance.

AC circuit analysis using complex variables with (a) capacitance and resistance, (b) resistance and inductance (c) capacitance and inductance (d) capacitance, inductance and resistance Series and parallel resonant circuit. Quality factor (Sharpness of resonance).

Unit II

Semiconductor Diodes : Energy bands in solids. Intrinsic and extrinsic semiconductor, Hall effect, P-N junction diode and their V-I characteristics. Zener and avalanche breakdown. Resistance of a diode, Light Emitting diodes (LED). Photo conduction in semiconductors, photodiode, Solar Cell.

Diode Rectifiers : P-N junction half wave and full wave rectifier. Types of filter circuits (L and - with theory). Zener diode as voltage regulator, simple regulated power supply.

Transistors : Junction Transistors, Bipolar transistors, working of NPN and PNP transistors, Transistor connections (C-B, C-E, C-C mode), constants of transistor. Transistor characteristic curves (excluding h parameter analysis), advantage of C-B configuration. C.R. O. (Principle, construction and working in detail).

Unit III

Transistor Amplifers : Transistor biasing, methods of Transistor biasing and stabilization. D.C. load line. Common-base and common-emitter transistor biasing. Common-base, common-emitteer amplifers. Classification of amplifers. Resistance-capacitance (R-C) coupled amplifer (two stage; concept of band width, no derivation). Feed-back in amplifers, advantage of negative feedback Emitter follower.

Oscillators : Oscillators, Principle of Oscillation, Classification of Oscillator. Condition for self sustained oscillation : Barkhousen Criterion for oscillations. Tuned collector common emitter oscillator. Hartley oscillator. Colpitt's oscillator.

References :

1. Electricity and Magnetism by Reitz and Milford (Prentice Hall of India)
2. Electricity and Magnetism by A.S. Mahajan and A.A. Rangwala (Tata McGraw Hill).
3. Basic Electronics and Linear circuits by N.N. Bhargava, D.C. Kulshreshtha and S.C. Gupta (TITI, CHD).
4. Soild State Electronics by J.P. Agarwal, Amit Agarwal (Pragati Prakashan, Meerut).
5. Electronic Fundamentals and Applications by J.D. Ryder (Prentice Hall India).

B.Sc. PHYSICS
Paper III Phy- 203
PRACTICALS

Max. Marks : 40
Time : 3 Hrs.

SPECIAL NOTES
1. Do any eight experiments .
2. The students are required to calculate the error involved in a particular experiment (percentage error).

NOTE

Distribution of Marks :

Experiment :	= 20 marks
Viva Voce :	= 10 marks
Lab Record :	= 10 marks
Total	= 40 marks

For giving marks under Lab. Record each college will maintain practical assessment record by using the following procedure :-

1. Each student has to perform a minimum number of experiments prescribed in the syllabus.
2. After the completion of a practical the teacher concerned will check the note-book and conduct the viva-voce of each student to find out how much concepts related to the theoretical and experimental part of the experiment he/she has understood. According to his/her performance marks will be recorded in their practical note book. These marks will constitute the lab record.
3. To complete the final marks for lab. record a separate register for each class of B.Sc will be maintained. The Student will be assigned a separate page on the register. On this page the marks obtained by the student in different practicals will be recorded. While taking the final average the total marks obtained will be divided by the total no. of required practicals, instead of the number of practicals performed by the student. This record will be signed by the concerned teacher.
4. The lab. record register will be presented to the external practical examiners for lab. record marks. The external examiners will verify the record randomly.

B.Sc. PHYSICS
Paper III- PHY 203
PRACTICALS

Max. Marks : 40
Time : 3 Hours

Note: Do eight experiments, selecting four from each section.

Section A

1 Surface Tension by Jeager's method.
2 Modulus of rigidity by Maxwell's needle.
3 Elastic constants by Searle's method.
4 Thermal conductivity of a good conductor by Searle's method.
5 'g' by Bar pendulum.

Section B

1 Low resistance by Carey Foster's Bridge with calibration.
2 Determination of impendance of an A.C. circuit and its verification.
3 Frequency of A.C. mains by sonometer using an electromagnet.
4 Measurement of angle dip by earth inductor.
5 High resistance by substitution method.
6 Verification of Inverse square law by photo-cell.

B.Sc. PHYSICS
SCHEME OF EXAMINATION
Semester III

Paper I- PHY 301 : Computer Programming, Thermodynamics

Max. Marks : 45
Internal Assessment : 10
Time : 3 Hrs.

NOTE :
1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

Unit-I
Computer Programming : Computer organisation, Binary representation, Algorithm development, flow charts and their interpretation.
Fortran Preliminaries; Integer and floating point arithmetic expression, built in functions executable and non-executable statements, input and output statements, Formats, I.F. DO and GO TO statements, Dimesion arrays statement function and function subprogram.

Unit-II
Thermodynamics-I : Second law of thermodynamics, Carnot theorem, Absolute scale of temperature, Absolute Zero, Entropy, show that $dQ/T=O$, T-S diagram Nernst heat law, Joule's free expansion, Joule Thomson (Porous plug) experiment. Joule - Thomson effect. Liquefication of gases. Air pollution due to internal combustion Engine.

Unit-III
Thermodynamics-II : Derivation of Clausius - Claperyron latent heat equation. Phase diagram and triple point of a substance. Development of Maxwell thermodynamical relations. Application of Maxwell relations in the derivation of relations between entropy, specific heats and thermodynamic variables.
Thermodynamic functions : Internal energy (U), Helmholtz function (F), Enthalpy (H), Gibbs function (G) and the relations between them.

References :
1. Rajaraman, Fortran Programming.
2. Schaum Series, Fortran 77.
3. Ram Kumar, Programming with Fortran - 77.
4. S. Lokanathan and R.S., Gambir, Statistical and Thermal Physics (An Introduction), Prentice Hall of India, Pvt., Ltd. (1991, New Delhi).
5. J.K. Sharma and K.K. Sarkar, Thermodynamics and statistical Physics, Himalaya Publishing House (1991, Bombay.)
6. M.W. Zemansky and R. Dittman, Heat and Thermodynamics, McGraw Hill, New York (1981).

B.Sc. PHYSICS
Paper-II PHY 302
Optics – I

Max. Marks : 45
Internal Assessment : 10
Time : 3 Hrs.

NOTE :
1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

Unit-I

Fourier Analysis and Fourier Transforms : Speed of transverse waves on a uniform string. Speed of longitudinal waves in a fluid, superposition of waves (physical idea), Fourier Analysis of complex waves and its application for the solution of triangular and rectangular waves, half and full wave rectifier out puts. Fourier transforms and its properties. Application of fourier transform to following function.

(I) $f(x)$ = $e_{-x2/2}$
(II) $f(x)$ = $I \, [x] < a$
                    $0 \, [x] > a$

Unit-II

Geometrical Optics : Matrix methods in paraxial optics, effects of translation and refraction, derivation of thin lens and thick lens formulae, unit plane, nodal planes, system of thin lenses, Chromatic, spherical coma, astigmatism and distortion aberrations and their remedies.
Physical Optics

Unit-III

Interference : Interference by Division of Wavefront : Fresnel's Biprism and its applications to determination of wave length of sodium light and thickness of a mica sheet, Lioyd's mirror, phase change on reflection.

References
1.   Mathematical Physics by B.S. Rajput and Yog Prakash Pragati Prakashan.
2.   Theory and Problems of Laplace Transforms by Murrari R. spiegel, McGraw Hill Book Company.
3.   Optics by Ajay Ghatak, Tata McGraw Hill 1977.
4.   Introduction of Optics by Frank L. Pedrotti and Leno S. Pedrotti, Prentice Hall 1987.

B.Sc. PHYSICS

Paper-III   Phy- 303
Practicals

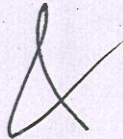Max. Marks : 40
Time : 3 Hrs.

Special Notes

1. Do any eight experiments.
2. The students are required to Calculate the error involved in a particular experiment (Percentage error).

Distribution of Marks :

Experiments :	=	20 Marks
Viva-Voce :	=	10 Marks
Lab. Record :	=	10 marks
Total		40 Marks

For Giving marks under Lab. Record each college will maintain practical assessment record by using the following procedure.

1. After the completion of a practical the teacher concerned will check the note-book and conduct the viva-voce of each student to find out how much concepts related to the theoretical and experimental part of the experiment he/she has understood. According to his/her performance marks will be recorded on their practical note book. These marks will contribute the lab Record.

2. To complete the final marks for lab. Record a separate register for each class of B.Sc. will be maintained. The students will be assigned a separate page on this register. On this page the marks obtained by the student in different practicals will be recorded. While taking the final average the total marks obtained will be divided by the total no. of required practicals, instead of the number of practicals performed by the student. This record will be signed by the concerned teacher.

3. The Lab. Record register will be presented to the external practical examiners for lab. Record marks. The external examiner will verify the record randomly.

B.Sc. PHYSICS
Paper III- PHY 303
PRACTICALS

Max. Marks : 40
Time : 3 Hours

Note: Do eight experiments, selecting four from each section.

Section A

1 To measure the (a) area of a window (b) height of an inaccesible object.
2 Refractive index and dispersive power of a prism material by spectrometer.
3 Resolving power of a telescope.
4 Comparision of Illuminating Powers by a Photometer.
5 Ordinary and extra ordinary refractive indices for calcite or quartz.

Section B
(i) Electronics
1 To draw common base and common emitter characteristics of a transistor and calculate transistor and calculate transistor characteristics parameters.
2 To study the ripple factor in a.d.c. power supply.
3 Electronic Voltmeter measurement of peak, average & R.M.S. values of signal.
4 Study of voltage doubler and trippler circuits.

(ii) Computer Experiments
1 To print out all natural (even/odd) number between given limits using computer.
2 To find maximum, minimum and range of a given set of numbers using computer.
3 To evaluate sum of finite series.

B.Sc. PHYSICS
SCHEME OF EXAMINATION
Semester IV

Paper I- PHY 401 : Statistical Mechanics

Max. Marks : 45
Internal Assessment : 10
Time : 3 Hrs.

NOTE :
1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

Unit-I

Probability, some probability considerations, combinations possessing maximum probability, combinations possessing minimum probability, distribution of molecules in two boxs. Case with   weightage (general). Phase space, microstates and macrostates, statistical fluctuations constraints and accessible States Thermodynamical probability.

Unit-II

Postulates of Statistical Physics. Division of Phase space into cells, Condition of equilibrium between two system in thermal contact. b-Parameter. Entropy and Probability, Boltzman's distribution law. Evaluation of A and b. Bose-Einstein statistics, Application of B.E. Statistics to Plancks's radiation law, B.E. gas.

Unit-III

Fermi-Dirac statistics, M.B. Law as limiting case of B.E. Degeneracy and B.E., Condensation. F.D. Gas, electron gas in metals. Zero point energy. Specific heat of metals and its solution.

References
1.   B.B. Laud, "Introduction to Statistical Mechanics" (Macmillan 1981).
2.   F. Reif, "Statistical Physics' (McGraw Hill 1988).
3.   K. Huang, "Statistical Physics" (Wiley Eastern 1988).

B.Sc. PHYSICS
Paper-II PHY 402
Optics – II

Max. Marks : 4 5
Internal Assessment : 1 0
Time : 3 Hrs.

NOTE :
1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

Unit-I
Interference by Division of Amplitude :Colour of thin, films, wedge shaped film, Newton's rings. Interferometers: Michelson's interferometer and its application to (I) Standardisation of a meter (II) determination of wave length. Fresuel's Diffraction : Fresnel's half period zones, zone plate, diffraction at a straight edge, rectangular slit and circular apperture.

Unit-II
Fraimhoffer diffraction : One slit diffraction, Two slit diffraction N-slit diffraction, Plane transmission granting spectrum, Dispersive power of a grating , Limit of resolution, Rayleigh's criterion, resolving power of telescope and a grating.

Unit-III
Polarization :Polarisation and Double Refraction : Polarisation by reflection, Polarisation by scattering, Malus law, Phenomenon of double refraction, Huytgen's wave theory of double refraction (Normal and oblique incidence), Analysis of Palorised light : Nicol prism, Quarter wave plate and half wave plate, production and detection of (i) Plane polarized light (ii) Circularly polarized light and (iii)Elliptically polarized light, Optical activity, Fresnel's theory of rotation, Specific rotation, Polarimeters (half shade and Biquartz).

References
1.   Optics by Ajay Ghatak, Tata McGraw Hill 1977.
2.   Introduction of Optics by Frank L. Pedrotti and Leno S. Pedrotti, Prentice Hall 1987.

B.Sc. PHYSICS
Paper-III   Phy- 403
Practicals

Max. Marks : 40
Time : 3 Hrs.

Special Notes

1.   Do any eight experiments.
2.   The students are required to Calculate the error involved in a particular experiment (Percentage error).
Note:-
Distribution of Marks :

Experiments :	=	20 Marks
Viva-Voce :	=	10 Marks
Lab. Record :	=	10 marks
Total	40 Marks	

For Giving marks under Lab. Record each college will maintain practical assessment record by using the following procedure.

1.   After the completion of a practical the teacher concerned will check the note-book and conduct the viva-voce of each student to find out how much concepts related to the theoretical and experimental part of the experiment he/she has understood. According to his/her performance marks will be recorded on their practical note book. These marks will contribute the lab Record.

2.   To complete the final marks for lab. Record a separate register for each class of B.Sc. will be maintained. The students will be assigned a separate page on this register. On this page the marks obtained by the student in different practicals will be recorded. While taking the final average the total marks obtained will be divided by the total no. of required practicals, instead of the number of practicals performed by the student. This record will be signed by the concerned teacher.

3.   The Lab. Record register will be presented to the external practical examiners for lab. Record marks. The external examiner will verify the record randomly.

New

B.Sc. PHYSICS
Paper III- PHY 403
PRACTICALS

Max. Marks : 40
Time : 3 Hours

Note: Do eight experiments, selecting four from each section.

Note:- This course will contain two parts (i) Electronics and (ii) Computer experiments. Students have to perform a minimum of four experiments from each part.

Section A

1 To draw a graph between wave length and minimum deviation for various lines from a Mercury discharge source.
2 Determination of wave length of Na light and the number of lines per centimeter using a diffraction grating.
3 Wave length by Newton's Rings.
4 Measurement of (a) Specific rotation (b) concentration of sugar solution using polarimeter.
5 To find the equivalent focal length of a lens system by nodal slide assembly.

Section B
(i)   **Electronics**
1 To draw frequency response curve of transistorised R.C. coupled amplifier.
2 Study of series and parallel resonance circuits.

3 To find out the frequency of a tuning fork by Melde's experiment.

(ii) Computer Experiments

1 Find the roots of a quadratic equation.
2 To find intergration of a definite integral by trapezoidal rule.
3 To find the area of a triangle, sphere and cylinder.
4 Given value for a,b,c and d and a set of values for the variable x evaluate the function defined by
$F(x)= ax2+bx+c$ if x<d
$F(x)= O$ if x=d
$F(x)= ax2+bx+c$ if x>d
For each value of x, and print the value of x and (fx). Write a program for an arbitrary number of x values.

INDIRA GANDHI UNIVERSITY, MEERPUR (REWARI)

Syllabi and Courses of reading for B.Sc. Part-I, Part-II and Part-III (Chemistry) w.e.f. 2019-2020

B.Sc (Ist Semester)

Paper No.	Code No.	Nomenclature	Periods (40 min. each)	Max. Marks Written + I.A.	Time
I	CH-101	Inorganic Chemistry(Theory)	30	30+8	3 Hrs
II	CH-102	Physical Chemistry(Theory)	30	29+7	3 hrs.
III	CH-103	Organic Chemistry (Theory)	30	29+7	3 hrs
IV	CH-104	Practicals	90	40	3½ hrs

B.Sc (IInd Semester)

Paper No.	Code No.	Nomenclature	Periods (40 min. each)	Max. Marks Written + I.A.	Time
V	CH-201	Inorganic Chemistry (theory)	30	30+8	3 hrs.
VI	CH-202	Physical Chemistry (Theory)	30	29+7	3 hrs.
VII	CH-203	Organic Chemistry (theory)	30	29+7	3 hrs.
VIII	CH-204	Practicals	90	40	3½ hrs

B.Sc (IIIrd Semester)

Paper No.	Code No.	Nomenclature	Periods (40 min. each)	Max. Marks Written + I.A.	Time
IX	CH-301	Inorganic Chemistry (Theory)	30	29+7	3 hrs.
X	CH-302	Physical Chemistry (theory)	30	30+8	3 hrs.
XI	CH-303	Organic Chemistry (theory)	30	29+7	3 hrs.
XII	CH-304	Practicals	90	40	3½ hrs

B.Sc (IVth Semester)

Paper No.	Code No.	Nomenclature	Periods (40 min. each	Max. Marks Written + I.A.	Time
XIII	CH-401	Inorganic Chemistry (theory)	30	29+7	3 hrs.
XIV	CH-402	Physical Chemistry (theory)	30	30+8	3 hrs.
XV	CH-403	Organic Chemistry (theory)	30	29+7	3 hrs.
XVI	CH-404	Practicals	90	40	3½ hrs

B.Sc (Vth) Semester

Paper No.	Code No.	Nomenclature	Periods (40 min. each	Max. Marks Written + I.A.	Time
XVII	CH-501	Inorganic Chemistry (theory)	30	29+7	3 hrs.
XVIII	CH-502	Physical Chemistry (theory)	30	29+7	3 hrs.
XIX	CH-503	Organic Chemistry (theory)	30	30+8	3 hrs.
XX	CH-504	Practicals	90	40	3½ hrs

B.Sc (VIth Semester)

Paper No.	Code No.	Nomenclature	Periods (40 min. each	Max. Marks Written + I.A.	Time
XXI	CH-601	Inorganic Chemistry (theory)	30	29+7	3 hrs.
XXII	CH-602	Physical Chemistry (theory)	30	29+7	3 hrs.
XXIII	CH-603	Organic Chemistry (theory)	30	30+8	3 hrs.
XXIV	CH-604	Practicals	70	40	3½ hrs

B. Sc Ist Semester

Paper I (Theory) Inorganic Chemistry   **Max. Marks: 30**
CH-101   **Time: 3 Hrs.**
Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing six short answer type questionscovering the entire syllabus and will be of six marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be of six marks each.

Section-A
Atomic Structure
Idea of de Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals, , quantum numbers, radial and angular wave functions and probability distribution curves, shapes of s, p, d orbitals.

Section-B
Periodic Properties
General principles of periodic table: Aufbau and Pauli exclusion principles, Hund's multiplicity rule. Electronic configurations of the elements, effective nuclear charge, Slater's rules. Atomic and ionic radii, ionization energy, electron affinity and electronegativity –definition, methods of determination or evaluation, trends in periodic table (in s &p block elements).

Section-C
Covalent Bond
Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions (BeF_2, BF_3, CH_4, PF_5, SF_6,IF_7 SO_{42} -, ClO_4-)Valence shell electron pair repulsion (VSEPR)5 theory to NH_3, H_3O_+, SF_4, CIF_3, ICI_2- and H_2O. MO theoryof heteronuclear (CO and NO) diatomic.molecules, , bond strength and bond energy, pe rcentage ionic character from dipole moment and electronegativity difference.

Section-D
Ionic Solids
Ionic structures (NaCl,CsCl, ZnS(Zinc Blende), CaF_2) radius ratio effect and coordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy (methamtical derivation exc luded) and Born-Haber cycle, solvation ene rgy and its relation with solubility of ionic solids, polarizing power and polarisability of ions, Fajan's rule.
6

B. Sc Ist Semester

Paper II (Theory) Physical Chemistry   **Marks: 29**
CH-102   **Time: 3 hrs.**

Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing five short answer type questions covering the entire syllabus and will be of five marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be of six marks each.

Section – A
Gaseous States
Maxwell's distribution of velocities and energies (derivation excluded) Calculation of root mean square velocity, average velocity and most probable velocity. Collision diameter, co llision number, col lision frequency and mean free path. Deviation of Real gases from ideal behaviour. Derivation of Vander Waal's Equation of State, its application in the calculation of Boyle's temperature (compression factor) Explanation of behaviour of real gases using Vander Waal's equation.

Secton-B
Critical Phenomenon: Critical temperature, Critical pressure, critical volume and their determination. PV isotherms of real gases, continuity of states, the isotherms of Vander Waal's equation, relationship between critical constants and Vander Waal"s constants. Critical compressibility fac tor. The Law of corresponding states. Lequifaction of gases.

Section-C
Liquid States
Structure of liquids. Properties of liquids – surface tension, viscosity vapour pressure and optical rotations and their determination.

Section-D
Solid State
Classification of solids, Laws of crystallography – (i) Law of constancy of interfacial angles (ii) Law of rationality of indices (iii) Law of symmetry. Symmetry elements of c rysta ls. Definition of unit cell & space lattice. Bravais lattices, crystal system. Xray diffraction by crystals. Derivation of Bragg equation. Determination o f crystal structure o f NaCl, KCl. Liquid crystals: Difference between solids, liquids and liquid crystals,types of liquid crystals. Applications of liquid crystals.

B. Sc. Ist Semester

Paper II I (Theory) Organic Chemistry   **Max. Marks: 29**

CH -103   **Time: 3 Hrs.**

Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing five short answer type questions covering the entire syllabus and will be of five marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be of six marks each.

Section-A
1. Structure and Bonding
Localized and delocalized chemical bond, van der Waals in teractions, resonance: conditions, resonance effect and its applications, hyperconjugation, inductive effect, Electromeric effect & their comparison.

2. Stereochemistry of Organic Compounds-I
Concept of isomerism. Types of isomerism. Optical isomerism, elements of symmetry, molecular chirality, enantiomers, stereogenic centre, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers, threo and eryth ro diastereomers, meso compounds, resolution of enantiomers, inversion, retention and racemization.

Section-B
Stereochemistry of Organic Compounds-II
Relative and absolute configuration, sequence rules, R & S systems of nomenclature. Geometric isomerism determination of configuration of geometric isomers. E & Z system of nomenclature, Conformational isomerism conformational analysis of ethane and n-butane, conformations of cyclohexane, axial and equatorial bonds,. Newman projection and Sawhorse formulae, Difference between configuration and conformation.

Section-C
.Mechanis m of Organic Reactions
Curved arrow notation, drawing electron movements with arrows, half-headed and double-headed arrows, homolytic and heterolytic bond breaking. Types of reagents – electrophiles and nucleophiles. Types of organic reactions. Energy considerations. Reactive intermediates carbocations, carbanions, free radicals, carbenes , arynes and nitrenes (formation, structure & stability). Assigning formal charges on intermediates and other ionic species.

Section-D

Alkanes and Cycloalkanes

IUPAC nomenclature of branched and unbranched alkanes , the alkyl group, classification of carbon atoms in alkanes. Isomerism in alkanes, sources, methods of formation (with special reference to Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids), physical properties. Cycloalkanes nomenclature, synthesis of cycloalkanes and their derivatives – photochemical (2+2) cycloaddition reactions, dehalogenation of -dihalides, pyrolysis of calcium or barium salts of dicarboxylic acids, Baeyer's strain theory and its limitations., theory of strainless rings.

B.Sc. (Ist Semester)

Paper IV (Practicals)   **Max. Marks: 40**

CH-104   **Time:** 3½ hrs

(Inorganic)

Volumetric Analysis

1. **Redox titrations**: Determination of Fe^{2+} , $C_2O_4^{2-}$ (using $KMnO_4$, $K_2Cr_2O_7$)

2. **Iodometic titrations:** Determination of Cu^{2+} (using standard hypo solution).

3. **Complexometric titrations:** Determination of Mg^{2+} , Zn^{2+} by EDTA.

(Physical)

1. To determine the specific reaction rate of the hydrolysis of methyl acetate/ethyl acetatecatalyzed by hydrogen ions at room temperature.

2. To prepare arsenious sulphide sol and compare the precipitating power of mono-, bi – and trivalent anions.

3. To determine the surface tension of a given liquid by drop number method.

4. To determine the viscosity of a given liquid**.**

5. To determine the specific refractivity of a given liquid

Distribution of marks

1. Volumetric Analysis   14 marks
2. Physical   12 marks
3. Copy   08 marks
4. Viva-Voce   06 marks

B. Sc IInd Semester

Paper V (Theory) Inorganic Chemistry   **Max. Marks: 30**
CH-201   **Time: 3 Hrs.**

Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing six short answer type questions covering the entire syllabus and will be of six marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be of six marks each

Section-A
.Hydrogen Bonding & Vander Waals Forces
Hydrogen Bonding – Definition, Types, effects of hydrogen bonding on properties of substances, applicat ion Brief discussion of various types of Vander Waals Forces
. **Metallic Bond and Semiconductors**
Metallic Bond- Brie f introduction to meta llic bond, band theory of meta llic bond Semiconductors- Introduction, types and applications.

Section-B
. **s-Block Eleme nts**
Comparative study of the elements including , diagonal relationships, salient features of hydrides (methods of preparation excluded), solvation and complexation tendencies including their function in biosystems.
Chemis try of Noble Gases Chemical properties of the noble gases with emphasis on their low chemical reactivity, chemistry of xenon, structure and bonding of fluorides, ox ides & oxyfluorides of xenon.

SECTION – C
p-Block Elements
Emphasis on comparative study of properties of p-block elements (including diagonal relationship and excluding methods of preparation).
Boron family (13$_{th}$ gp):-
Diborane – properties and structure (as an example of electron – deficient compound and multicentre bonding), Borazene – chemical properties and structure Trihalides of Boron – Trends in fewis acid character structure of aluminium (III) chloride.
Carbon Family (14$_{th}$ group)
Catenation, p π– d π bonding (an idea), carbides, fluorocarbons, silicates structural aspects), silicons – general methods of preparations, properties and uses.

SECTION-D

Nitrogen Family (15th group)
Oxides – structures of oxides of N,P. oxyacids – structure and relative acid strengths of oxyacids of Nitrogen and phosphorus. Structure of white, yellow and red phosphorus.

Oxygen Family (16th group)
Oxyacids of sulphur – structures and acidic strength H_2O_2–structure, properties and uses.

Halogen Fami l y (17th group)
Basic prope r ties of ha logen, interha logens types propert ies ,hydro and oxyacids of chlorine – structure and compari son of acid strength .

B. Sc. IInd Semester

Paper VI (Theory) Physical Chemistry   **Marks: 29**

CH-202   **Time: 3 Hrs.**

Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing five short answer type questions covering the entire syllabus and will be of five marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be o f s ix marks each

Section – A
Kinetics-I
Rate of reaction, rate equation, factors influencing the rate of a reaction – concentration, temperature, pressure, solvent, light, catalyst. Order of a reaction, integrated rate expression for zero order, first order, second and third order reaction. Half life period of a reaction. Methods of determination of order of reaction.

Section – B
Kinetics-II
Effect of temperature on the rate of reaction – Arrhenius equation. Theories of reaction rate – Simple collision theory for unimolecular and bimolecular collision. Transition state theory of Bimolecular reactions.

Section-C

Electrochemistry-I

Electrolytic conduction, factors affecting electrolytic conduction, specific, conductance, molar conductance,equivalent conductance and relation among them, their vartion with concentration.Arrhenius theory of ionization, Ostwald's Dilution Law. Debye- Huckel – Onsager's equation for strong electrolytes (elementary treatment only) Transport number, definition and determination by Hittorfs methods, (numerical included)

Section-D

Electrochemistry-II

Kohlarausch's Law, calculation of molar ionic conductance and effect of viscosity temperature & pressure on it. Application of Kohlarausch's Law in calculation of conductance of weak electrolytes at infinite diloution. Applications of conductivity measurements: determination of degree of dissociation, determination of K_a of acids determination of solubility product of spa ringly soluble salts, conductometric titrations. Definition of pH   and pK_a, Buffer solution, Buffer action, Henderson – Hazel equation, Buffer mechanism of buffer action.

B. Sc IInd Semester

Paper VII (Theory) Organic Chemistry   **Max. Marks: 29**

CH-203   **Time: 3 Hrs.**

Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing five short answer type questions covering the entire syllabus and will be of five marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be o f s ix marks each

Section-A

.Alkenes

Nomenclatu re of alkenes, , mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halides,. The Saytzeff rule, Hofmann elimination, physical p roperties and relative stabilities of alkenes. Chemical reactions of alkenes ☐ mechanisms involved in hydrogenation, electrophilic and free radical additions, Markownikoff's rule, hydroboration–oxidation, oxymercurationreduction, ozonolysis, hydration, hydroxylation and oxidation with $KMnO_4$,

<center>**Section-B**</center>

.Arenes and Aromaticity

Nomenclatu re of benzene deriva tives:. Aromatic nucleus and side chain. Aromaticity: the Huckel rule, aromatic ions, annulenes up to 10 carbon atoms, aromatic, anti - aromatic and non – aromatic compounds. Aromatic electrophilic substitution general pattern of the mechanism, mechansim of nitration, halogenation, sulphonation, and Friedel-Crafts reaction. Energy profile diagrams. Activating , deactivating subs tituents and orientation.

<center>**Section-C**</center>

Dienes and Alkynes

Nomenclature and classification of dienes: isolated, conjugated and cumulated dienes. Structure of butadiene,. Chemical reactions 1,2 and 1,4 additions (Electrophilic & free radical mechanism), Diels-Alder reaction, Nomenclature, structure and bonding in alkynes. Methods of formation. Chemical reactions of alkynes, acidity of alkynes. Mechanism of electrophilic and nucleophilic addition reactions, hydroboration-oxidation of alkynes

<center>**Section-D**</center>

Alkyl and Aryl Halides

Nomenclatu re and classes of alkyl halides, methods of formation, chemical reactions. Mechanisms and stereochemistry of nucleophilic substitution reactions of alkyl halides , S_N2 and $S_N1$reactions with energy profile diagrams.Methods of formation and reactions of aryl halides, The additionelimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions. Relative reactivities of alkyl halides vs allyl, vinyl and aryl halides.

B.Sc IInd Semester

Paper VIII (Practicals)   **Max. Marks: 40**

CH-204   **Time: 3½ hrs**

Inorganic

Paper Chromatography

Qualitative Analysis of the any one of the following Inorganic cations and anions by paper chromatography (Pb^{2+} , Cu^{2+} , Ca^{2+} , Ni^{2+} , Cl^- , Br^- , I^- and PO_4^{3-} and NO_3^-).

(Organic)

1. . Preparation and purification through crystallization or distillation and ascertaining their purity through melting point or boiling point

   (i)   Iodoform from ethanol (or acetone)

   (ii)   )   *m* - Dinitrobenzne from nitrobenzene (use 1 : 2 conc. HNO_3 - H_2SO_4 mixture if fuming HNO_3 is not available)

   iii)   i)   p- Bromoacetanilide from acetanilide

   iv)   Dibenzalacetone from acetone and benzaldehyde

   v)   Aspirin from salicylic acid

2 . To study the process of) sublimati on of camphor and phthalic acid.

Distribution of marks

1. Paper Chromatography   10 marks
2. Organic Preparation   16 marks
3. Copy   08 marks
4. Viva-Voce   06 marks

B. Sc IIIrd Semester

Paper IX (Theory) Inorganic Chemistry   Max. Marks: 29

CH-301   Time: 3 Hrs.

Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing five short answer type questions covering the entire syllabus and will be of five marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be o f s ix marks each

Section-A
Chemistry of Elements of Ist transition series:
Definition of transition elements, position in the periodic table, General characteristics & properites of Ist transition elements,. Structures & properties of some compounds of transition elements – TiO_2, $VOCl_2$, $FeCl_3$, $CuCl_2$ and $Ni(CO)_4$

Section-B
Chemistry of Elements of IInd & IIIrd transition series
General characteristics and properties of the IInd and IIIrd trans ition elements Comparison of properties of 3d elements with 4d & 5d elements with reference only to ionic radii, oxidation state, magnetic and Spectral properties and stereochemistry

Section-C
Coordination Compounds
Werner's coordination theory, effective atomic number concept, chelates, nomenclature of coordination compounds, isomerism in coordination compounds, valence bond theory of transition metal complexes

Section-D
Non-aqueous Solvents
Physical properties of a solvent, types of solvents and their general characteristics, reactions in non-aqueous solvents with reference to liquid NH_3 and liquid SO_2

B. Sc. IIIrd Semester

Paper X (Theory) Physical Chemistry   Marks: 30

CH-302   Time: 3 Hrs
.
Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing six short answer type questions covering the entire syllabus and will be of six marks. Further,

examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be o f s ix marks each

SECTION – A

Thermodynamics-I

Defin ition of thermodynamic terms: system,surrounding etc. Types of systems, intensive and extensive properties. State and path functions and their differentials. Thermodynamic process. Concept of heat and work. Zeroth Law of thermodynamics, First law of thermodynamics: statement, definition of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule's law – Joule – Thomson coefficient for ideal gass and real gas: and inversion temperature.

SECTION – B

Thermodynamics-II

Calculation of w.q. dU & dH for the expansion of ideal gases under isothermal and adiabatic conditions for reve rsible process, Temperature dependence of enthalpy, Kirchoffs equation. Bond energies and applications o f bond energies.

SECTION – C

Chemical Equilibrium

Equilibrium constant and free energy, concept of chemical potential, Thermodynamic derivation of law of chemical equilibrium. Temperature dependence of equilibrium constant; Van't Hoff reaction isochore, Van't Hoff reaction isotherm. Le-Chatetier's principle and its applica tions Clapeyron equation and Clausius – Clapeyron equation its applications.

SECTION – D

Dis tributioln Law

Nernst distribution law – its thermodynamic derivation, Modification of distribution law when solute undergoes dissociation, association and chemical combination. Applications of distribution law: (i) Determination of degree of hydrolysis and hydrolysis constant of aniline hydrochloride. (ii) Determination of equilibrium constant of potassium tri-iodide complex and process of extraction.

B. Sc. IIIrd Semester

Paper XI (Theory) Organic Chemistry   **Max. Marks: 29**

CH-303   **Time: 3 Hrs.**

Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing five short answer type questions covering the entire syllabus and will be of five marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be o f s ix marks each

Section-A

1. **Alcohols**
Monohydric alcohols □ nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding. Acidic nature. Reactions of alcohols. Dihydric alcohols — nomenclature, methods of formation, chemical reactions of vicinal glycols, oxidative cleavage [$Pb(OAc)_4$ and HIO_4] and pinacol-pinacolone rearrangement.

2. Epoxides
Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, orientation of epoxide ring opening, reactions of Grignard and organolithium reagents with epoxides

Section-B

.Phenols
Nomenclature, structure and bonding. Preparation of phenols, physical properties and acidic character. Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion. Reactions of phenols — electrophilic aromatic substitution, Mechanisms of Fries rearrangement, Claisen rearrangement, Reimer-Tiemann reaction, Kolbe's reaction and Schotten and Baumann reactions.
23

Section-C

. Ultraviole t (UV) absorption spectroscopy
Absorption laws (Beer-Lambert law), molar absorptivity, presentation and analysis of UV spectra, types of electronic transitions, effect of conjugation. Concept of chromophore and auxochrome. Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. UV spectra of conjugated enes and enones,Woodward- Fieser rules, calculation of $\square_{max}$ of simple conjugated dienes and $\square,\square$ -unsaturated ketones. Applications o f UV Spectroscopy in structure elucidation of simple organic compounds.

Section-D

.**Carboxylic Acids & Acid Derivatives**

Nomenclatu re of Carboxylic acids, structure and bonding, physical properties, acidity of carboxylic acids, effects of substituents on acid strength. Preparation of carboxylic acids. Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction. Reduction of carboxylic acids. Mechanism of decarboxylation. Structure , nomenclature and preparation of acid chlorides, esters, amides and acid anhydrides. Relative s tability o f acyl derivatives. Phys ical properties, interconvers ion of acid derivatives by nucleophilic acyl substitution. Mechanisms of es ter ifica tion and hydrolysis (acidic and basic).

B.Sc (IIIrd Semester)

Paper XII (Practical)   **Max. Marks: 40**

CH-304   **Time: 3½ hrs**

(Inorganic)

1.   **Gravimetric Analysis**

   Quantitative estimations of, Cu^{2+} as copper thiocyanate and Ni^{2+} as Ni – dimethylglyoxime.

(Organic)

Systematic identification (detection of extra elements, functional groups, determination of melting point or boiling point and preparation of at least one pure solid derivative) of the following simple mono and bifunctional organic compounds: Naphthalene,

anthracene, acenaphthene, benzyl chloride, p-dichlorobenzene, m-dinitrobenzene , p-nitrotoluene, resorcinol, hydroquinone, α- naphthol, β - naphthol, benzophenone, ethyl methyl ketone, benzaldehyde, vanillin, oxalic acid, succinic acid, benzoic acid, salicyclic acid, aspirin, phthalic acid, cinnamic acid, benzamide, urea, acetanilide, benzanilide, aniline hydrochloride, p - toluidine, phenyl salicylate (salol), glucose, fructose, s ucrose, o-, m-, p - nitroanilines, thiourea.

Distribution of marks

1.	Gravimetric Analysis	10 marks
2.	Organic Analysis	16 marks
3.	Copy	08 marks
4.	Viva-voce	06 marks

B. Sc. IVth Semester

Paper XIII (Theory) Inorganic Chemistry   Max. Marks: 29

CH-401   Time: 3 Hrs.

Note: Examiner will set nine questions and the candidates will berequired to attempt five questions in all. Question number one will be compulsory containing five short answer type questions covering the entire syllabus and will be of five marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be o f s ix marks each

Section-A
Chemistry of   f – block elements
Lanthanides
Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.

Section-B
Chemis try of   f – block elements
Actinides
General features and chemistry of actinides, chemistry of separation of Np, Pu and Am from U, Comparison of properties of Lanthanides and Actinides and with trans ition elements .

Section-C
Theory of Quali tative and Quanti tative Inorganic Analysis-I
Chemistry of analysis of various acidic radicals, Chemistry of identification of acid radicals in typical combinations, Chemistry of interference of acid radicals including their removal in the analys is of basic radicals.

Section-D
Theory of Quali tative and Quanti tative Inorganic Analysis-II
Chemistry of analysis of various groups of basic radicals, Theory of precipitation, co-precipitation, Post- precipitation, purification of precipitates.

B. Sc. IVth Semester

Paper XIV (Theory) Physical Chemistry   **Marks: 30**

CH-402   **Time: 3 Hrs.**

Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing six short answer type questions covering the entire syllabus and will be of six marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be of six marks each.

Section-A

Thermodynamics-III
Second law of thermodynamics, need for the law, different statements of the law, Carnot's cycles and its efficiency, Carnot's theorm, Thermodynamics scale of temperature. Concept of entropy – entropy as a state function, entropy as a function of V & T, entropy as a function of P & T, entropy change in physica l change, entropy as a criteria of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases.

Section-B
Thermodynamics-IV
Third law of thermodynamics: Nernst heat theorem, statement of concept of residual entropy, evaluation of absolute entropy from heat capacity data. Gibbs and Helmholtz functions; Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities, A & G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. Variation of G and A with P, V and T.

Section-C
Electrochemistry-III
Electrolytic and Galvanic cells – reversible & Irreversible cells , conventional representation of electrochemical cells. EMF of cell and its measurement, Wes ton standard cell, activity and activity coefficients. Calculation of thermodynamic quantities of cell reaction ($\Box$G, $\Box$H & K). Types of reversible electrodes – metal-metal ion gas electrode, metal –insoluble salt- anion and redox electrodes. Electrode reactions, Nernst equations, derivation of cell EMF and single electrode potential. Standard Hydrogen electrode, reference electrodes, standard electrodes potential, sign conventions, electrochemical se ries and its applications.

Section-D
Electrochemistry-IV
Concentration cells with and without transference, liquid junction potential, application of EMF measurement i.e. valency of ions, solubility product activity

coefficient, potentiometric titration (acid- base and redox). Determination of pH using Hydrogen electrode, Quinhydrone electrode and glass electrode by potentiometric methods.

B. Sc. IVth Semester

Paper XV (Theory) Organic Chemistry   **Marks: 29**

CH-403   **Time: 3 Hrs.**

Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing five short answer type questions covering the entire syllabus and will be of five marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be o f s ix marks each

Section-A
. Infrared (IR) absorption spectroscopy
Molecular vibrations, Hooke's law, selection rules, intensity and position of IR bands, measurement of IR spectrum, fingerprint region, characteristic absorptions of various functional groups and interpretation of IR spectra of simple organic compounds.
Applica tions of IR spectroscopy in structure e lucidation of simple organic compounds.

Section-B
. Amines
Structure and nomenclatu re of amines, phys ical properties. Separation of a mixture of primary, secondary and tertiary amines.Structural featu res affecting basicity of amines. Prepa ration of alkyl and aryl amines (reduction of nitro compounds, nitriles, reductive amination of aldehydic and ketonic compounds. Gabrielphthalimide reaction, Hofmann bromamide reaction. electrophilic aromatic substitution in aryl amines, reactions of amines with nitrous acid.

Section-C
1. Diazonium Salts
Mechanism of diazotisation, structure of benzene diazonium chloride, Replacement of diazo group by H, OH, F, Cl, Br, I, NO_2 and CN groups, reduction of diazonium salts to hyrazines, coupling reaction and its synthetic application.

2. Nitro Compounds
Preparation of nitro alkanes and nitro arenes and their chemical reactions. Mechanism of electrophilic substitution reactions in nitro arenes and their reductions in acidic, neutral and alkaline medium.

Section-D

. Aldehydes and Ketones
Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, advantage of oxidation of alcohols with chromium trioxide (Sarett reagent) pyridinium chlorochromate (PCC) and pyridinium dichromate., Physical properties. Comparison of reactivities of aldehydes and ketones. Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin, aldol, Perkin and Knoevenagel condensations. Condensation with ammonia and its derivatives. Wittig reaction. Mannich reaction.Oxidation of aldehydes, Baeyer–Villiger oxidation of ketones, Cannizzaro reaction. MPV, Clemmensen, Wolff-Kishner, $LiAlH_4$ and $NaBH_4$ reductions.

B.Sc. (IVth Semester)

Paper XVI (Practical)	**Max. Marks: 40**
CH-404	**Time:** 3½ hrs

Inorganic

Colorimetry:

To verify Beer - Lambert law for $KMnO_4$ / $K_2Cr_2O_7$ and determine the concentration of the given $KMnO_4$ / $K_2Cr_2O_7$ solution.

3. . Preparations: Preparation of Cuprous chloride, prussion blue from iron fillings, tetraammine cupric sulpha te, chrome alum, potassium trioxalatochromate(III).

(Physical)

1. To determine the CST of phenol – water system.

2. To determine the solubility of benzoic acid at various temperatures and to determine the ΔH of the dissolution process

3. . To determine the enthalpy of neutralisation of a weak acid/ weak base vs. strong base/ strong acid and determine the enthalpy of ionisation of the weak acid/ weak base.

4. To determine the enthalpy of solution of solid calcium chloride

5 .To study the distribution of iodine between water and CCl_4.

Distribution of marks

1. Colorimetry	12 marks
2 . Physical	14 marks
3 . Copy	08 marks
4 . Viva- Voce	06 marks

B. Sc Vth Semester

Paper XVII (Theory) Inorganic Chemistry   **Max. Marks: 29**

CH-501   **Time: 3Hrs .**

Note : Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing five short answer type questions covering the entire syllabus and will be of five marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be o f s ix marks each

SECTION–A
Metal-ligand Bonding in Transition Metal Complexes
Limitations of valence bond theory, an elementary idea of cr ystal-f ield theory, crystal field split ting in octahedral, tetrahedral and square planar complexes, factors affecting the crystal-f ield parameters.

SECTION–B
Thermodynamic and Kinetic Aspects of Metal Complexe
A brief outline of thermodynamic stability of metal complexes and factors affec ting the s tab ility, substitution reac tions of square planar complexes of Pt(II).

S**ECTION-C**
Magnetic Properties of Transition Metal Complexe
Types of magnetic behaviour, methods of determining magnetic susceptibility, spin-only formula. L-S coupling, correlation of $\square_s$ and $\square_{eff}$ values, orbital contribution to magnetic moments, application of magnetic moment data for 3dmetal complexes.
3

SECTION-D
Electron Spectra of Transition Metal Complexes
Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states, spectrochemical series. Orgel-energy level diagram for d_1 and d_9 states, discussion of the electronic spectrum of $[Ti(H_2O)_6]_{3+}$ complex ion.

B. Sc. Vth Semester

Paper XVIII (Theory) Physical Chemistry   **Marks: 29**

CH-502   **Time: 3 Hrs.**

Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing five short answer type questions covering the entire syllabus and will be of five marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be o f s ix marks each

Section-A
Quantum Mechanic s-I
Black-body radiation, Plank's radiation law, photoelectric effect, heat capacity of solids, Compton effect,wave function and its significance of Postulates of quantum mechanics , quantum mechanical operator, commutation relations, Hamiltonial operator, Hermitian operator, average value of square of Hermitian as a
positive quantity, Role of operators in quantum mechanics, To show quantum mechanically that position and momentum cannot be predicated simultaneously, Determination of wave function & energy of a partic le in one dimensional box, Pictorial representation and its significance.

Section-B
Physical Properties and Molecular Structure
Optica l activity, polarization – (clausius – Mossotti equation). Orientation of dipoles in an electric field, dipole moment, included dipole moment, measurement of dipole moment-temperature method and refractivity method, dipole moment and structure of molecules, Magnetic permeability, magnetic susceptibility and its determination. Applica tion of magnetic susceptibility, magnetic properties – paramagnetism, diamagnetism and ferromagnetics.

Section-C
Spectroscopy-I
Introduction: Electromagnetic radiation, regions of spectrum, basic features of spectroscopy, statement of Bornoppenheimer approximation, Degrees of freedom.

Rotational Spectrum
Diatomic molecules. Energy levels of rigid rotator (semi-classical principles), selection rules, spectral intensity distribution using population distribution (Maxwell-Boltzmann distribution), determination of bond length, qualitative description of non-rigid rotor, isotope effect.

Section-D

Spectroscopy-II
Vibrational spectrum

Infrared spectrum: Energy levels of simple harmonic oscillator, selection rules, pure vibrational spectrum, intensity, determination of force constant and qualitative relation of force constant and bond energies, effects of anharmonic motion and isotopic effect on the spectra., idea of vibrational frequencies of different functional groups.

Raman Spectrum:

Concept of polarizibility, pure rotational and pure vibrational Raman spectra of diatomic molecules, selectin rules, Quantum theory of Raman spectra.

B. Sc Vth Semester

Paper XIX (Theory) Organic Chemistry   **Marks: 30**

CH-503   **Time: 3 Hrs.**

Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing six short answer type questions covering the entire syllabus and will be of six marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be of six marks each.

Section-A
NMR Spectroscopy-I

Principle of nuclear magnetic resonance, the PMR spectrum,number of signals, peak areas, equivalent and nonequivalent protons positions of signals and chemical shift,shielding and deshielding of protons, proton counting,splitting of signals and coupling constants, magnetic equivalence of protons.

Section-B
NMR Spectroscopy-II

Discuss ion of PMR spectra of the molecules: ethyl bromide, npropyl bromide, isopropyl bromide, 1,1-dibromoethane, 1,1,2-tribromoethane, ethanol, acetaldehyde, ethyl acetate, toluene, benzaldehyde and acetophenone..Simple problems on PMR spectroscopy for structure determination of organic compounds.

SECTION – C

Carbohydrates-I

Classification and nomenclature. Monosaccharides, mechanism of osazone formation, inte rconversion of glucose and fructose, chain lengthening and chain shortening of aldoses. Configuration of monosaccharides. Erythro and threo diastereomers. Conversion of glucose in to mannose. Formation of glycos ides, ethers and esters.
Determination of ring size of glucose and fructose. Open chain and cyclic structure of D(+)-glucose & D(-) fructose. Mechanism ofmutarotation. Structures of ribose and deoxyribose.

SECTION – D

1. Carbohydrates-II

An introduc tion to disaccharides (maltose, sucrose and lactose) and polysaccharides (starch and cellulose) without involving structure determination.

2. Organometallic Compounds

Organomagnesium compounds: the Grignard reagents-formation, structure and chemical reactions. Organozinc compounds: formation and chemical reactions. Organolithium compounds: formation and chemical reactions.

B.Sc (Vth Semester)

Paper XX (Practical)   **Max. Marks: 40**

CH-504   **Time: 3½ hrs**

(Inorganic)

Salt Analysis

Semimicro qualitative analysis of mixture containing not more than four radicals (including interfering, Combinations and excluding insoluables):

Pb^{2+}, Hg^{2+}, Hg_2^{2+}, Ag^+, Bi^{3+}, Cu^{2+}, Cd^{2+}, As^{3+}, Sb^{3+}, Sn^{2+}, Fe^{3+}, Cr^{3+}, Al^{3+}, Co^{2+}, Ni^{2+}, Mn^{2+}, Zn^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+}, Mg^{2+}, NH_4^+, CO_3^{2-}, S^{2-}, SO_3^{2-}, $S_2O_3^{2-}$, NO_2^-, CH_3COO^-, Cl^-, Br^-, I^-, NO_3^-, SO_4^{2-}, $C_2O_4^{2-}$, PO_4^{3-}, BO_3^{3-}

(Organic)

1.   Laboratory Techniques

(a) **Steam distillation**   (non evaluative)

Naphthalene from its suspension in water

Separation of *o* - and *p* - nitrophenols

(b) **Column chromatography**   (non evaluative)

Separation of fluorescein and methylene blue

Separation of leaf pigments from spinach leaves

2.   Thin Layer Chromatography

Determination of R_f values and identification of organic compounds

(a) Separation of green leaf pigments (spinach leaves may be used)

(b)) Separation of a mixture of colored organic compounds using common organic solvents.

Distribution of marks

1 . Salt Analysis	16 marks
2 . Organic	10 marks
3 . Copy	08 marks
4 . Viva- Voce	06 marks

B. Sc. VIth Semester

Paper XXI (Theory) Inorganic Chemistry   **Max. Marks: 29**

CH-601   **Time: 3 Hrs.**

Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing five short answer type questions covering the entire syllabus and will be of five marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be o f six marks each

Section-A
Organometallic Chemistry
Definition, nomenclature and classification of organometallic compounds. Preparation, properties, and bonding of alkyls of Li, Al, Hg, and Sn a brief account of metal-ethylenic complexes, mononuclear carbonyls and the nature of bonding in metal carbonyls.

Section-B
Acids and Bases, HSAB Concept
Arrhenius, Bronsted – Lowry, the Lux – Flood, Solvent system and Lewis concepts of acids & bases, relative strength of acids & bases, Concept of Hard and Soft Acids & Bases. Symbiosis, electronegativity and hardness and softness

Section—C
Bioinorganic Chemistry
Essential and trace elements in biological processes, metalloporphyrins with special reference to haemoglobin and myoglobin. Biological role of alkali and alkaline earth metal ions with special reference to Ca_{2+}. Nitrogen fixation.

Section—D
Sil icones and Phosphazenes
Silicones and phosphazenes, their preparation, properties,structure and uses

B. Sc. VIth Semester

Paper XXII (Theory) Physical Chemistry　　　　　　**Marks: 29**

CH-602　　　　　　　　　　　　　　　　　　　　**Time: 3 Hrs**
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Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing five short answer type questions covering the entire syllabus and will be of five marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be of six marks each.

Section-A
Spectroscopy-III
Electronic Spectrum
Concept of potential energy curves for bonding and antibonding molecular orbitals, qualitative description of selection rules and Franck- Condon principle. Qualitative description of sigma and pie and n molecular orbital (MO) their energy level and respective transitions.

Section-B
Photochemistry
Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry: Grotthus-Drapper law, Stark- Einstein law (law of photochemical equivalence) Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing), quantum yield, photosensitized reactions-energy transfer processes (simple examples).

Section-C
Solutions:
Dilute Solutions and Colligative Properties
Ideal and non-ideal solutions, methods of expressing concentrations of solutions, activity and activity coefficient. Dilute solution,Colligative properties, Raolut's law, relative lowering of vapour pressure, molelcular weight determination, Osmosis law of osmotic pressure and its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point, Thermodynamic derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods for determining various colligative properties. Abnormal molar mass, degree of dissociation and association of solutes.

Section-D

Phase Equillibrium

Statement and meaning of the terms – phase component and degree of freedom, thermodynamic derivation of Gibbs phase rule, phase equilibria of one component system –Example – water and Sulpher systems.

Phase equilibria of two component systems solid-liquid equilibria, simple eutectic Example Pb-Ag system, desilerisation of lead

B. Sc VIth Semester

Paper XXIII (Theory) Organic Chemistry   **Marks: 30**

CH-603   **Time: 3 Hrs.**

Note: Examiner will set nine questions and the candidates will be required to attempt five questions in all. Question number one will be compulsory containing six short answer type questions covering the entire syllabus and will be of six marks. Further, examiner will set two questions from each section and the candidates will be required to attempt one question from each section which will be of six marks each.

SECTION – A

Heterocyclic Compounds-I

Introduction: Molecular orbital p icture and aromatic characteristics of pyrrole, furan, thiophene and pyridine. Methods of synthesis and chemical reactions with particular emphasis on the mechanism of electrophilic substitution. Mechanism of nucleophilic substitution reactions in pyridine derivatives. Comparison of basicity of pyridine, piperidine and pyrrole

SECTION – B

1. Heterocyclic Compounds-II

Introduction to condensed five and six- membered heterocycles. Prepration and reactions of indole, quinoline and isoquinoline with special reference to Fisher indole synthesis, Skraup synthesis and Bischler-Napieralski synthesis. Mechanism of electrophilic substitution reactions of, quinoline and isoquinoline

2. Organosulphur Compounds

Nomenclature, structural features, Methods of formation and chemical reactions of thiols, thioethers, sulphonic acids, sulphonamides and sulphaguanidine. Synthetic detergents alkyl and aryl sulphonates.

SECTION – C

1. Organic Synthesis *via* Enolates

Acidity of -hydrogens, alkylation of diethyl malonate and ethyl acetoacetate. Synthesis of ethyl acetoacetate: the Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate.

2. Synthetic Polymers

Addition or chain-growth polymerization. Free radical vinyl polymerization, ionic vinyl polymerization, Ziegler-Natta polymerization and vinyl polymers.
Condensat ion or step growth polymerization. Polyeste rs ,polyamides, phenol formaldehyde resins, urea formaldehyde resins, epoxy re sins and polyurethanes.
Natural and synthetic rubbers.

Section – D

Amino Acids, Peptides& Proteins

Classification, of amino acids. Acid-base behavior, isoelectric point and electrophoresis. Preparation of -amino acids.Structure and nomenclature of peptides and proteins. Classification of proteins. Peptide structure determination, end group analysis, selective hydrolysis of peptides. Classical peptide synthesis, solid–phase peptide synthesis. Structures of peptides and proteins: Primary & Secondary structure.

B.Sc (VIth Semester)

Paper XXIV (Practical)   **Max. Marks: 40**

CH-604   **Time:** 3½ hrs

(Physical)

1. To determine the strength of the given acid solution (mono and dibasic acid) conductometrically.

2. To determine the solubility and solubility product of a sparingly soluble electrolyte conductometrically

3. To determine the strength of given acid solution (mono and dibasic acid) potentiometrically.

4. To determine the molecular weight of a non-volatile solute by Rast method.

5. To standardize the given acid solution (mono and dibasic acid) pH metrically.

(Organic)

Synthesis of the following organic compounds:

(a)   To prepare o-chlorobenzoic acid from anthranilic acid.

(b)   To prepare p-bromoaniline from p-bromoacetanilide.

(c)   To prepare m-nitroaniline from m-dinitrobenzene.

(d)   To prepare S-Benzyl-iso-thiouronium chloride from thiourea.

Distribution of marks

1.	Physical	12 marks
2.	Organic Preparation	14 marks
3.	Copy	08 marks
4.	Viva-Voce	06 marks

NEW SCHEME

Scheme of Examination of B.Sc. 1ˢᵗ Semester Mathematics
(w.e.f. 2018-2019)

Paper Code	Title of the Paper	Allocation of Periods	Maximum Marks		
			Theory	Internal Assessment	Total
12BSM 111	Algebra	6 periods/ 4 hours per week	40	10	
12BSM 112	Calculus	6 periods/ 4 hours per week	40	10	150
12BSM 113	Solid Geometry	6 periods/ 4 hours per week	40	10	

Note:- The other conditions will remain the same as per relevant ordinance and rules and regulations of the University.

(w.e.f. 2018-19)

<u>Algebra</u>

Paper: 12BSM 111   **Max. Marks:**

| 7 x 4 = 28 |
| 2 x 6 = 12 |
| Total = 40 |

Time: 3 Hours

<u>Note:</u> The question paper will consist of **five** sections. Each of the first four sections(**I-IV**) will contain two questions(each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I

Symmetric, Skew symmetric, Hermitian and skew Hermitian matrices. Elementary Operations on matrices. Rank of a matrices. Inverse of a matrix. Linear dependence and independence of rows and columns of matrices. Row rank and column rank of a matrix. Eigenvalues, eigenvectors and the characteristic equation of a matrix. Minimal polynomial of a matrix. Cayley Hamilton theorem and its use in finding the inverse of a matrix.

Section – II

Applications of matrices to a system of linear (both homogeneous and non–homogeneous) equations. Theorems on consistency of a system of linear equations. Unitary and Orthogonal Matrices, Bilinear and Quadratic forms.

Section – III

Relations between the roots and coefficients of general polynomial equation in one variable. Solutions of polynomial equations having conditions on roots. Common roots and multiple roots. Transformation of equations.

Section – IV :

Nature of the roots of an equation Descarte's rule of signs. Solutions of cubic equations (Cardon's method). Biquadratic equations and their solutions.

Books Recommended :

1.   H.S. Hall and S.R. Knight : Higher Algebra, H.M. Publications 1994.

2.   Shanti Narayan : A Text Books of Matrices.

3.   Chandrika Prasad : Text Book on Algebra and Theory of Equations.

        Pothishala Private Ltd., Allahabad.

(w.e.f. 2018-19)
<u>Calculus</u>

Paper: 12BSM 112   **Max. Marks:**

7 x 4 = 28
2 x 6 = 12
Total = 40

Time: 3 Hours

<u>Note:</u> The question paper will consist of **five** sections. Each of the first four sections (*I-IV*) will contain two questions (each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Definition of the limit of a function. Basic properties of limits, Continuous functions and classification of discontinuities. Differentiability. Successive differentiation. Leibnitz theorem. Maclaurin and Taylor series expansions.

Section – II
Asymptotes in Cartesian coordinates, intersection of curve and its asymptotes, asymptotes in polar coordinates. Curvature, radius of curvature for Cartesian curves, parametric curves, polar curves. Newton's method. Radius of curvature for pedal curves. Tangential polar equations. Centre of curvature. Circle of curvature. Chord of curvature, evolutes. Tests for concavity and convexity. Points of inflexion. Multiple points. Cusps, nodes & conjugate points. Type of cusps.

Section – III :
Tracing of curves in Cartesian, parametric and polar co-ordinates. Reduction formulae. Rectification, intrinsic equations of curve.

Section – IV :
Quardrature (area)Sectorial area. Area bounded by closed curves. Volumes and surfaces of solids of revolution. Theorems of Pappu's and Guilden.

Books Recommended :

1. Differential and Integral Calculus : Shanti Narayan.

2. Murray R. Spiegel : Theory and Problems of Advanced Calculus. Schaun's Outline series. Schaum Publishing Co., New York.

3. N. Piskunov : Differential and integral Calculus. Peace Publishers, Moscow.

4. Gorakh Prasad : Differential Calculus. Pothishasla Pvt. Ltd., Allahabad.

5. Gorakh Prasad : Integral Calculus. Pothishala Pvt. Ltd., Allahabad.

(w.e.f. 2018-19)

Solid Geometry

Paper: 12BSM 113   **Max. Marks:**

7 x 4 = 28
2 x 6 = 12
Total = 40

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections (*I-IV*) will contain two questions (each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I :
General equation of second degree. Tracing of conics. Tangent at any point to the conic, chord of contact, pole of line to the conic, director circle of conic. System of conics. Confocal conics. Polar equation of a conic, tangent and normal to the conic.

Section – II :
Sphere: Plane section of a sphere. Sphere through a given circle. Intersection of two spheres, radical plane of two spheres. Co-oxal system of spheres
Cones. Right circular cone, enveloping cone and reciprocal cone.
Cylinder: Right circular cylinder and enveloping cylinder.

Section – III :
Central Conicoids: Equation of tangent plane. Director sphere. Normal to the conicoids. Polar plane of a point. Enveloping cone of a coincoid. Enveloping cylinder of a coincoid.

Section – IV :
Paraboloids: Circular section, Plane sections of conicoids.
Generating lines. Confocal conicoid. Reduction of second degree equations.

Books Recommended

1.   R.J.T. Bill, Elementary Treatise on Coordinary Geometry of Three Dimensions, MacMillan India Ltd. 1994.
2.   P.K. Jain and Khalil Ahmad : A Textbook of Analytical Geometry of Three Dimensions, Wiley Eastern Ltd. 1999.

NEW SCHEME

Scheme of Examination of B.Sc 2nd Semester Mathematics
(w.e.f. 2018-2019)

Paper Code	Title of the Paper	Allocation of Periods	Maximum Marks		
			Theory	Internal Assessment	Total
12BSM 121	Number Theory and Trigonometry	6 periods/ 4 hours per week	40	10	150
12BSM 122	Ordinary Differential Equations	6 periods/ 4 hours per week	40	10	
12BSM 123	Vector Calculus	6 periods/ 4 hours per week	40	10	

Note:- The other conditions will remain the same as per relevant ordinance and rules and regulations of the University.

(w.e.f. 2018-19)

Number Theory and Trigonometry

Paper: 12BSM 121   **Max. Marks:**

7 x 4 = 28
2 x 6 = 12
Total = 40

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I :
Divisibility, G.C.D.(greatest common divisors), L.C.M.(least common multiple)
Primes, Fundamental Theorem of Arithemetic. Linear Congruences, Fermat's theorem. Wilson's theorem and its converse. Linear Diophanatine equations in two variables

Section – II :

Complete residue system and reduced residue system modulo m. Euler's ø function Euler's generalization of Fermat's theorem. Chinese Remainder Theorem. Quadratic residues. Legendre symbols. Lemma of Gauss; Gauss reciprocity law. Greatest integer function [x]. The number of divisors and the sum of divisors of a natural number n (The functions d(n) and σ(n)). Moebius function and Moebius inversion formula.

Section - III :

De Moivre's Theorem and its Applications. Expansion of trigonometrical functions. Direct circular and hyperbolic functions and their properties.

Section – IV :

Inverse circular and hyperbolic functions and their properties. Logarithm of a complex quantity. Gregory's series. Summation of Trigonometry series.

Books Recommended :

1. S.L. Loney : Plane Trigonometry Part – II, Macmillan and Company, London.
2. R.S. Verma and K.S. Sukla : Text Book on Trigonometry, Pothishala Pvt. Ltd. Allahabad.
3. Ivan Ninen and H.S. Zuckerman. An Introduction to the Theory of Numbers.

(w.e.f. 2018-19)

Ordinary Differential Equations

Paper: 12BSM 122   Max. Marks:

7 x 4 = 28
2 x 6 = 12
Total = 40

Time: 3 Hours

<u>**Note:**</u> The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I :
Geometrical meaning of a differential equation. Exact differential equations, integrating factors. First order higher degree equations solvable for x,y,p Lagrange's equations, Clairaut's equations. Equation reducible to Clairaut's form. Singular solutions.

Section – II :
Orthogonal trajectories: in Cartesian coordinates and polar coordinates. Self orthogonal family of curves.. Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations. Equations reducible to homogeneous linear ordinary differential equations.

Section – III :
Linear differential equations of second order: Reduction to normal form. Transformation of the equation by changing the dependent variable/ the independent variable. Solution by operators of non-homogeneous linear differential equations. Reduction of order of a differential equation. Method of variations of parameters. Method of undetermined coefficients.

Section – IV :
Ordinary simultaneous differential equations. Solution of simultaneous differential equations involving operators x (d/dx) or t (d/dt) etc. Simultaneous equation of the form dx/P = dy/Q = dz/R. Total differential equations. Condition for Pdx + Qdy +Rdz = 0 to be exact. General method of solving Pdx + Qdy + Rdz = 0 by taking one variable constant. Method of auxiliary equations.

Books Recommended :

1.   D.A. Murray : Introductory Course in Differential Equations. Orient Longaman (India) . 1967
2.   A.R.Forsyth : A Treatise on Differential Equations, Machmillan and Co. Ltd. London
3.   E.A. Codington : Introduction to Differential Equations.
4.   S.L.Ross: Differential Equations, John Wiley & Sons
5.   B.Rai & D.P. Chaudhary : Ordinary Differential Equations; Narosa, Publishing House Pvt. Ltd.

(w.e.f. 2018-19)

Vector Calculus

Paper: 12BSM 123   **Max. Marks:**

| 7 x 4 = 28 |
| 2 x 6 = 12 |
| **Total = 40** |

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions (each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Scalar and vector product of three vectors, product of four vectors. Reciprocal vectors. Vector differentiation. Scalar Valued point functions, vector valued point functions, derivative along a curve, directional derivatives.

Section – II

Gradient of a scalar point function, geometrical interpretation of grad Φ , character of gradient as a point function. Divergence and curl of vector point function, characters of Div $\vec{f}$ and Curl $\vec{f}$ as point function, examples. Gradient, divergence and curl of sums and product and their related vector identities. Laplacian operator.

Section – III
Orthogonal curvilinear coordinates Conditions for orthogonality fundamental triad of mutually orthogonal unit vectors. Gradient, Divergence, Curl and Laplacian operators in terms of orthogonal curvilinear coordinates, Cylindrical co-ordinates and Spherical co-ordinates.

Section – IV

Vector integration; Line integral, Surface integral, Volume integral.
Theorems of Gauss, Green & Stokes and problems based on these theorms.

Books Recommended:
1.   Murrary R. Spiegal : Theory and Problems of Advanced Calculus, Schaum Publishing Company, New York.
2.   Murrary R. Spiegal : Vector Analysis, Schaum Publisghing Company, New York.
3.   N. Saran and S.N. NIgam. Introduction to Vector Analysis, Pothishala Pvt. Ltd., Allahabad.
4.   Shanti Narayna : A Text Book of Vector Calculus. S. Chand & Co., New Delhi.

NEW SCHEME

Scheme of Examination of B.Sc. 3rd Semester Mathematics (w.e.f. 2018-2019)

Paper Code	Title of the Paper	Allocation of Periods	Maximum Marks		
			Theory	Internal Assessment	Total
12BSM 231	Advanced Calculus	6 periods/ 4 hours per week	40	10	
12BSM 232	Partial Differential Equations	6 periods/ 4 hours per week	40	10	150
12BSM 233	Statics	6 periods/ 4 hours per week	40	10	

Note:- The other conditions will remain the same as per relevant ordinance and rules and regulations of the University.

(w.e.f. 2018-19)

Advanced Calculus

Paper: 12BSM 231

Max. Marks:

7 x 4 = 28
2 x 6 = 12
Total = 40

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I

Continuity, Sequential Continuity, properties of continuous functions, Uniform continuity, chain rule of differentiability. Mean value theorems; Rolle's Theorem and Lagrange's mean value theorem and their geometrical interpretations. Taylor's Theorem with various forms of remainders, Darboux intermediate value theorem for derivatives, Indeterminate forms.

Section – II

Limit and continuity of real valued functions of two variables. Partial differentiation. Total Differentials; Composite functions & implicit functions. Change of variables. Homogenous functions & Euler's theorem on homogeneous functions. Taylor's theorem for functions of two variables.

Section – III

Differentiability of real valued functions of two variables. Schwarz and Young's theorem. Implicit function theorem. Maxima, Minima and saddle points of two variables. Lagrange's method of multipliers.

Section – IV

Curves: Tangents, Principal normals, Binormals, Serret-Frenet formulae. Locus of the centre of curvature, Spherical curvature, Locus of centre of Spherical curvature, Involutes, evolutes, Bertrand Curves. Surfaces: Tangent planes, one parameter family of surfaces, Envelopes.

Books Recommended:
1. C.E. Weatherburn : Differential Geometry of three dimensions, Radhe Publishing House, Calcutta
2. Gabriel Klaumber : Mathematical analysis, Mrcel Dekkar, Inc., New York, 1975
3. R.R. Goldberg : Real Analysis, Oxford & I.B.H. Publishing Co., New Delhi, 1970
4. Gorakh Prasad : Differential Calculus, Pothishala Pvt. Ltd., Allahabad
5. S.C. Malik : Mathematical Analysis, Wiley Eastern Ltd., Allahabad.
6. Shanti Narayan : A Course in Mathemtical Analysis, S.Chand and company, New Delhi
7. Murray, R. Spiegel : Theory and Problems of Advanced Calculus, Schaum Publishing co., New York

(w.e.f. 2018-19)
Partial Differential Equations

Paper: 12BSM 232

Max. Marks:

7 x 4 = 28
2 x 6 = 12
Total = 40

Time: 3 Hours

<u>**Note:**</u> The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Partial differential equations: Formation, order and degree, Linear and Non-Linear Partial differential equations of the first order: Complete solution, singular solution, General solution, Solution of Lagrange's linear equations, Charpit's general method of solution. Compatible systems of first order equations, Jacobi's method.

Section – II
Linear partial differential equations of second and higher orders, Linear and non-linear homogenious and non-homogenious equations with constant co-efficients, Partial differential eqution with variable co-efficients reducible to equations with constant coefficients, their complimentary functions and particular Integrals, Equations reducible to linear equations with constant co-efficients.

Section – III
Classification of linear partial differential equations of second order, Hyperbolic, parabolic and elliptic types, Reduction of second order linear partial differential equations to Canonical (Normal) forms and their solutions, Solution of linear hyperbolic equations, Monge's method for partial differential equations of second order.

Section – IV
Cauchy's problem for second order partial differential equations, Characteristic equations and characteristic curves of second order partial differential equation, Method of separation of variables: Solution of Laplace's equation, Wave equation (one and two dimensions), Diffusion (Heat) equation (one and two dimension) in Cartesian Co-ordinate system.

Books Recommended:
1. D.A.Murray: Introductory Course on Differential Equations, Orient Longman, (India), 1967
2. Erwin Kreyszing : Advanced Engineering Mathematics, John Wiley & Sons, Inc., New York, 1999
3. A.R. Forsyth : A Treatise on Differential Equations, Macmillan and Co. Ltd.
4. Ian N.Sneddon : Elements of Partial Differential Equations, McGraw Hill Book Company, 1988
5. Frank Ayres : Theory and Problems of Differential Equations, McGraw Hill Book Company, 1972
6. J.N. Sharma & Kehar Singh : Partial Differential Equations

(w.e.f. 2018-19)

Statics

Paper: 12BSM 233

Max. Marks:

7 x 4 = 28
2 x 6 = 12

Total = 40

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions (each carrying 7 marks.) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Composition and resolution of forces. Parallel forces. Moments and Couples.

Section – II
Analytical conditions of equilibrium of coplanar forces. Friction. Centre of Gravity.

Section – III
Virtual work. Forces in three dimensions. Poinsots central axis.

Section – IV
Wrenches. Null lines and planes. Stable and unstable equilibrium.

Books Recommended:
1. S.L. Loney : Statics, Macmillan Company, London

2. R.S. Verma : A Text Book on Statics, Pothishala Pvt. Ltd., Allahabad

NEW SCHEME

Scheme of Examination of B.Sc 4th Semester Mathematics
(w.e.f. 2018-2019)

Paper Code	Title of the Paper	Allocation of Periods	Maximum Marks			
			Theory	Internal Assessment	Practical	Total
12BSM 241	Sequences and Series	6 periods/ 4 hours per week	40	10		150
12BSM 242	Special Functions and Integral transforms	6 periods/ 4 hours per week	40	10		
12BSM 243	Programming in C and Numerical Methods	6 periods/ 4 hours per week	30	--	20	

 Note:- The other conditions will remain the same as per relevant ordinance and rules and regulations of the University.

(w.e.f. 2018-19)
Sequences and Series

Paper: 12BSM 241

Max. Marks:

7 x 4 = 28
2 x 6 = 12
Total = 40

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Boundedness of the set of real numbers; least upper bound, greatest lower bound of a set, neighborhoods, interior points, isolated points, limit points, open sets, closed set, interior of a set, closure of a set in real numbers and their properties. Bolzano-Weiestrass theorem, Open covers, Compact sets and Heine-Borel Theorem.

Section – II
Sequence: Real Sequences and their convergence, Theorem on limits of sequence, Bounded and monotonic sequences, Cauchy's sequence, Cauchy general principle of convergence, Subsequences, Subsequential limits.
Infinite series: Convergence and divergence of Infinite Series, Comparison Tests of positive terms Infinite series, Cauchy's general principle of Convergence of series, Convergence and divergence of geometric series, Hyper Harmonic series or p-series.

Section – III
Infinite series: D-Alembert's ratio test, Raabe's test, Logarithmic test, de Morgan and Bertrand's test, Cauchy's Nth root test, Gauss Test, Cauchy's integral test, Cauchy's condensation test.

Section – IV
Alternating series, Leibnitz's test, absolute and conditional convergence, Arbitrary series: abel's lemma, Abel's test, Dirichlet's test, Insertion and removal of parenthesis, re-arrangement of terms in a series, Dirichlet's theorem, Riemann's Re-arrangement theorem, Pringsheim's theorem (statement only), Multiplication of series, Cauchy product of series, (definitions and examples only) Convergence and absolute convergence of infinite products.

Books Recommended:
1. R.R. Goldberg : Real Analysis, Oxford & I.B.H. Publishing Co., New Delhi, 1970
2. S.C. Malik : Mathematical Analysis, Wiley Eastern Ltd., Allahabad.
3. Shanti Narayan : A Course in Mathematical Analysis, S.Chand and company, New Delhi
4. Murray, R. Spiegel : Theory and Problems of Advanced Calculus, Schaum Publishing co., New York
5. T.M. Apostol: Mathematical Analysis, Narosa Publishing House, New Delhi, 1985
6. Earl D. Rainville, Infinite Series, The Macmillan Co., New York

(w.e.f. 2018-19)
Special Functions and Integral Transforms

Paper: 12BSM 242

Max. Marks:

| 7 x 4 = 28 |
| 2 x 6 = 12 |
| Total = 40 |

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I

Series solution of differential equations – Power series method, Definitions of Beta and Gamma functions. Bessel equation and its solution: Bessel functions and their properties-Convergence, recurrence, Relations and generating functions, Orthogonality of Bessel functions.

Section – II

Legendre and Hermite differentials equations and their solutions: Legendre and Hermite functions and their properties-Recurrence Relations and generating functions. Orhogonality of Legendre and Hermite polynomials. Rodrigues' Formula for Legendre & Hermite Polynomials, Laplace Integral Representation of Legendre polynomial.

Section – III

Laplace Transforms – Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems, Laplace transforms of derivatives and integrals, Differentiation and integration of Laplace transforms, Convolution theorem, Inverse Laplace transforms, convolution theorem, Inverse Laplace transforms of derivatives and integrals, solution of ordinary differential equations using Laplace transform.

Section – IV

Fourier transforms: Linearity property, Shifting, Modulation, Convolution Theorem, Fourier Transform of Derivatives, Relations between Fourier transform and Laplace transform, Parseval's identity for Fourier transforms, solution of differential Equations using Fourier Transforms.

Books Recommended:
1. Erwin Kreyszing : Advanced Engineering Mathematics, John Wiley & Sons, Inc., New York, 1999
2. A.R. Forsyth : A Treatise on Differential Equations, Macmillan and Co. Ltd.
3. I.N. Sneddon : Special Functions on mathematics, Physics & Chemistry.
4. W.W. Bell : Special Functions for Scientists & Engineers.
5. I.N. Sneddon: the use of integral transform, McGraw Hill, 1972
6. Murray R. Spiegel: Laplace transform, Schaum's Series.

(w.e.f. 2018-19)
Programming in C and Numerical Methods

Part-A (Theory)

Paper:12BSM 243

Max. Marks:

5.5 x 2 = 11
5 x 2 = 10
1.5 x 6 = 9
Total = 30

Time: 3 Hours

<u>**Note:-**</u> The question paper will consist of **five** sections. Each of the first two sections *(I-II)* will contains two questions (each carrying 5.5 marks). Each of the **IIIrd** and **IVth** sections will contain two questions (each carrying 5 marks). The students shall be asked to attempt **one** question from each section *(I-IV)*. **Section-V** will contain **six** short answer type questions (each carrying 1.5 marks) without any internal choice covering the entire syllabus and shall be **compulsory**.

Section – I
Programmer's model of a computer, Algorithms, Flow charts, Data types, Operators and expressions, Input / outputs functions.

Section – II
Decisions control structure: Decision statements, Logical and conditional statements, Implementation of Loops, Switch Statement & Case control structures. Functions, Preprocessors and Arrays.

Section – III
Strings: Character Data Type, Standard String handling Functions, Arithmetic Operations on Characters. Structures: Definition, using Structures, use of Structures in Arrays and Arrays in Structures. Pointers: Pointers Data type, Pointers and Arrays, Pointers and Functions.
Solution of Algebraic and Transcendental equations: Bisection method, Regula-Falsi method, Secant method, Newton-Raphson's method. Newton's iterative method for finding pth root of a number, Order of convergence of above methods.

Section – IV
Simultaneous linear algebraic equations: Gauss-elimination method, Gauss-Jordan method, Triangularization method (LU decomposition method). Crout's method, Cholesky Decomposition method. Iterative method, Jacobi's method, Gauss-Seidal's method, Relaxation method.

Books Recommended:
1. B.W. Kernighan and D.M. Ritchie : The C Programming Language, 2nd Edition
2. V. Rajaraman : Programming in C, Prentice Hall of India, 1994
3. Byron S. Gottfried : Theory and Problems of Programming with C, Tata McGraw-Hill Publishing Co. Ltd., 1998
4. M.K. Jain, S.R.K.Lyengar, R.K. Jain : Numerical Method, Problems and Solutions, New Age International (P) Ltd., 1996
5. M.K. Jain, S.R.K. Lyengar, R.K. Jain : Numerical Method for Scientific and Engineering Computation, New Age International (P) Ltd., 1999
6. Computer Oriented Numerical Methods, Prentice Hall of India Pvt. Ltd.
7. Programming in ANSI C, E. Balagurusamy, Tata McGraw-Hill Publishing Co. Ltd.
8. Programming in ANSI C, E. Balagurusamy, Tata McGraw-Hill Publishing Co. Ltd.

9. Babu Ram: Numerical Methods, Pearson Publication.
10. R.S. Gupta, Elements of Numerical Analysis, Macmillan's India 2010.

Part-B (Practical)

Max. Marks: 20

Time: 3 Hours

There will be a separate practical paper which will consist simple programs in C and the implementation of Numerical Methods, studied in the paper 12BSM 243 (Part-A).

NEW SCHEME

Scheme of Examination of B.Sc. 5ᵗʰ Semester Mathematics
(w.e.f. 2018-2019)

Paper Code	Title of the Paper	Allocation of Periods	Maximum Marks			
			Theory	Internal Assessment	Practical	Total
12BSM 351	Real Analysis	6 periods/ 4 hours per week	40	10	--	150
12BSM 352	Groups and Rings	6 periods/ 4 hours per week	40	10	--	
12BSM 363	Numerical Analysis	6 periods/ 4 hours per week	30	--	20	

Note:- The other conditions will remain the same as per relevant ordinance and rules and regulations of the University.

(w.e.f. 2018-19)

Real Analysis

Paper: 12BSM 351

Max. Marks:

7 x 4 = 28
2 x 6 = 12
Total = 40

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Riemann integral, Integrabililty of continuous and monotonic functions, The Fundamental theorem of integral calculus. Mean value theorems of integral calculus.

Section – II
Improper integrals and their convergence, Comparison tests, Abel's and Dirichlet's tests, Frullani's integral, Integral as a function of a parameter. Continuity, Differentiability and integrability of an integral of a function of a parameter.

Section – III
Definition and examples of metric spaces, neighborhoods, limit points, interior points, open and closed sets, closure and interior, boundary points, subspace of a metric space, equivalent metrics, Cauchy sequences, completeness, Cantor's intersection theorem, Baire's category theorem, contraction Principle

Section – IV
Continuous functions, uniform continuity, compactness for metric spaces, sequential compactness, Bolzano-Weierstrass property, total boundedness, finite intersection property, continuity in relation with compactness, connectedness , components, continuity in relation with connectedness.

Book s Recommended:
1. P.K. Jain and Khalil Ahmad: Metric Spaces, 2nd Ed., Narosa, 2004
2. T.M. Apostol: Mathematical Analysis, Narosa Publishing House, New Delhi, 1985
3. R.R. Goldberg : Real analysis, Oxford & IBH publishing Co., New Delhi, 1970
4. D. Somasundaram and B. Choudhary : A First Course in Mathematical Analysis, Narosa Publishing House, New Delhi, 1997
5. Shanti Narayan : A Course of Mathematical Analysis, S. Chand & Co., New Delhi
6. E.T. Copson, Metric Spaces, Cambridge University Press, 1968.
7. G.F. Simmons : Introduction to Topology and Modern Analysis, McGraw Hill, 1963.

(w.e.f. 2018-19)
Groups and Rings

Paper: 12BSM 352

Max. Marks:

7 x 4 = 28
2 x 6 = 12
Total = 40

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Definition of a group with example and simple properties of groups, Subgroups and Subgroup criteria, Generation of groups, cyclic groups, Cosets, Left and right cosets, Index of a sub-group Coset decomposition, Largrage's theorem and its consequences, Normal subgroups, Quotient groups,

Section – II
Homoomorphisms, isomophisms, automorphisms and inner automorphisms of a group. Automorphisms of cyclic groups, Permutations groups. Even and odd permutations. Alternating groups, Cayley's theorem, Center of a group and derived group of a group.

Section – III
Introduction to rings, subrings, integral domains and fields, Characteristics of a ring. Ring homomorphisms, ideals (principle, prime and Maximal) and Quotient rings, Field of quotients of an integral domain.

Section – IV
Euclidean rings, Polynomial rings, Polynomials over the rational field, The Eisenstein's criterion, Polynomial rings over commutative rings, Unique factorization domain, R unique factorization domain implies so is $R[X_1, X_2……X_n]$

Books Recommended:
1. I.N. Herstein : Topics in Algebra, Wiley Eastern Ltd., New Delhi, 1975

2. P.B. Bhattacharya, S.K. Jain and S.R. Nagpal : Basic Abstract Algebra (2nd edition).
3. Vivek Sahai and Vikas Bist : Algebra, NKarosa Publishing House.
4. I.S. Luther and I.B.S. Passi : Algebra, Vol.-II, Norsa Publishing House.
5. J.B. Gallian: Abstract Algebra, Narosa Publishing House.

(w.e.f. 2018-19)
Numerical Analysis

Part-A (Theory)
Paper: 12BSM 363

Max. Marks:

5.5 x 2 = 11
5 x 2 = 10
1.5 x 6 = 9
Total = 30

Time: 3 Hours

Note:- The question paper will consist of **five** sections. Each of the first two sections *(I-II)* will contains two questions (each carrying 5.5 marks). Each of the **IIIrd** and **IVth** sections will contain two questions (each carrying 5 marks). The students shall be asked to attempt **one** question from each section *(I-IV)*. **Section-V** will contain **six** short answer type questions (each carrying 1.5 marks) without any internal choice covering the entire syllabus and shall be **compulsory**.

Section – I
Finite Differences operators and their relations. Finding the missing terms and effect of error in a difference tabular values, Interpolation with equal intervals: Newton's forward and Newton's backward interpolation formulae. Interpolation with unequal intervals: Newton's divided difference, Lagrange's Interpolation formulae, Hermite Formula.

Section – II
Central Differences: Gauss forward and Gauss's backward interpolation formulae, Sterling, Bessel Formula.
Probability distribution of random variables, Binomial distribution, Poisson's distribution, Normal distribution: Mean, Variance and Fitting.

Section – III
Numerical Differentiation: Derivative of a function using interpolation formulae as studied in Sections –I & II.
Eigen Value Problems: Power method, Jacobi's method, Given's method, House-Holder's method, QR method, Lanczos method.

Section – IV
Numerical Integration: Newton-Cote's Quadrature formula, Trapezoidal rule, Simpson's one-third and three-eighth rule, Chebychev formula, Gauss Quadrature formula.
Numerical solution of ordinary differential equations: Single step methods-Picard's method. Taylor's series method, Euler's method, Runge-Kutta Methods. Multiple step methods; Predictor-corrector method, Modified Euler's method, Milne-Simpson's method.

Books Recommended:
1. Babu Ram: Numerical Methods, Pearson Publication.

2. R.S. Gupta, Elements of Numerical Analysis, Macmillan's India 2010.

3. M.K. Jain, S.R.K.Iyengar, R.K. Jain : Numerical Method, Problems and Solutions, New Age International (P) Ltd., 1996

4. M.K. Jain, S.R.K. Iyengar, R.K. Jain : Numerical Method for Scientific and Engineering Computation, New Age International (P) Ltd., 1999

5. C.E. Froberg : Introduction to Numerical Analysis (2nd Edition).

6. Melvin J. Maaron : Numerical Analysis-A Practical Approach, Macmillan Publishing Co., Inc., New York

7. R.Y. Rubnistein : Simulation and the Monte Carlo Methods, John Wiley, 1981

8. Radhey S. Gupta: Elements of Numerical Analysis, Macmillan Publishing Co.

<u>Part-B (Practical)</u>

Max. Marks: 12

Time: 3 Hours

There will be a separate practical paper which will consist simple programs in C and the implementation of Numerical Methods, studied in the paper 12BSM 363 (Part-A).

NEW SCHEME

Scheme of Examination of B.Sc 6th Semester Mathematics
(w.e.f. 2018-2019)

Paper Code	Title of the Paper	Allocation of Periods	Maximum Marks		
			Theory	Internal Assessment	Total
12BSM 361	Real and Complex Analysis	6 periods/ 4 hours per week	40	10	150
12BSM 362	Linear Algebra	6 periods/ 4 hours per week	40	10	
12BSM 353	Dynamics	6 periods/ 4 hours per week	40	10	

Note:- The other conditions will remain the same as per relevant ordinance and rules and regulations of the University.

(w.e.f. 2018-19)

Real and Complex Analysis

Paper: 12BSM 361

Max. Marks:

7 x 4 = 28
2 x 6 = 12
Total = 40

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions(each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Jacobians, Beta and Gama functions, Double and Triple integrals, Dirichlets integrals, change of order of integration in double integrals.

Section – II
Fourier's series: Fourier expansion of piecewise monotonic functions, Properties of Fourier Co-efficients, Dirichlet's conditions, Parseval's identity for Fourier series, Fourier series for even and odd functions, Half range series, Change of Intervals.

Section – III
Extended Complex Plane, Stereographic projection of complex numbers, continuity and differentiability of complex functions, Analytic functions, Cauchy-Riemann equations. Harmonic functions.

Section – IV
Mappings by elementary functions: Translation, rotation, Magnification and Inversion. Conformal Mappings, Mobius transformations. Fixed pints, Cross ratio, Inverse Points and critical mappings.

Books Recommended:

1. T.M. Apostol: Mathematical Analysis, Narosa Publishing House, New Delhi, 1985

2. R.R. Goldberg : Real analysis, Oxford & IBH publishing Co., New Delhi, 1970

3. D. Somasundaram and B. Choudhary : A First Course in Mathematical, Analysis, Narosa Publishing House, New Delhi, 1997

4. Shanti Narayan : A Course of Mathematical Analysis, S. Chand & Co., New Delhi

5. R.V. Churchill & J.W. Brown: Complex Variables and Applications, 5th Edition, McGraw-Hill, New York, 1990

6. Shanti Narayan : Theory of Functions of a Complex Variable, S. Chand & Co., New Delhi.

(w.e.f. 2018-19)
Linear Algebra

Paper: 12BSM 362

Max. Marks:

7 x 4 = 28
2 x 6 = 12
Total = 40

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(***I-IV***) will contain two questions(each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions(each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Vector spaces, subspaces, Sum and Direct sum of subspaces, Linear span, Linearly Independent and dependent subsets of a vector space. Finitely generated vector space, Existence theorem for basis of a finitely generated vactor space, Finite dimensional vector spaces, Invariance of the number of elements of bases sets, Dimensions, Quotient space and its dimension.
Section – II
Homomorphism and isomorphism of vector spaces, Linear transformations and linear forms on vactor spaces, Vactor space of all the linear transformations Dual Spaces, Bidual spaces, annihilator of subspaces of finite dimentional vactor spaces, Null Space, Range space of a linear transformation, Rank and Nullity Theorem,
Section – III
Algebra of Liner Transformation, Minimal Polynomial of a linear transformation, Singular and non-singular linear transformations, Matrix of a linear Transformation, Change of basis, Eigen values and Eigen vectors of linear transformations.
Section – IV
Inner product spaces, Cauchy-Schwarz inequality, Orthogonal vectors, Orthogonal complements, Orthogonal sets and Basis, Bessel's inequality for finite dimensional vector spaces, Gram-Schmidt, Orthogonalization process, Adjoint of a linear transformation and its properties, Unitary linear transformations.
Books Recommended:
1.   I.N. Herstein : Topics in Algebra, Wiley Eastern Ltd., New Delhi, 1975
2.   P.B. Bhattacharya, S.K. Jain and S.R. Nagpal : Basic Abstract Algebra (2ⁿᵈ edition).
3.   Vivek Sahai and Vikas Bist : Algebra, Narosa Publishing House.
      I.S. Luther and I.B.S. Passi : Algebra, Vol.-II, Narosa Publishing House.

(w.e.f. 2018-19)
Dynamics

Paper: 12BSM 353

Max. Marks:

7 x 4 = 28
2 x 6 = 12
Total = 40

Time: 3 Hours

Note: The question paper will consist of **five** sections. Each of the first four sections(*I-IV*) will contain two questions (each carrying 7 marks) and the students shall be asked to attempt **one** question from each section. **Section-V** will contain **six** short answer type questions (each carrying 2 marks) without any internal choice covering the entire syllabus and shall be **compulsory.**

Section – I
Velocity and acceleration along radial, transverse, tangential and normal directions. Relative velocity and acceleration. Simple harmonic motion. Elastic strings.

Section – II
Mass, Momentum and Force. Newton's laws of motion. Work, Power and Energy. Definitions of Conservative forces and Impulsive forces.

Section – III
Motion on smooth and rough plane curves. Projectile motion of a particle in a plane. Vector angular velocity.

Section – IV
General motion of a rigid body. Central Orbits, Kepler laws of motion. Motion of a particle in three dimensions. Acceleration in terms of different co-ordinate systems.

Books Recommended:
1. S.L.Loney : An Elementary Treatise on the Dynamics of a Particle and a Rigid Bodies, Cambridge University Press, 1956

2. F. Chorlton : Dynamics, CBS Publishers, New Delhi

3. A.S. Ramsey: Dynamics Part-1&2, CBS Publisher & Distributors.

SCHEME OF EXAMINATION FOR B.Sc. (BOTANY) SEMESTER SYSTEM
w.e.f. Session 2016-17
Scheme of B.Sc. 1st Year

Semester I					
Sr. No.	Paper code	Nomenclature	Marks+IA	Periods / week	Exam. Duration
1.	BOT.1.1	Diversity of Microbes	40+10	4	3 hrs.
2.	BOT 1.2	Cell Biology	40+10	4	3 hrs.
3.	P-101	Practical (1.1& 1.2)	50	8	3hrs
Semester II					
4.	BOT 2.1	Diversity of Archegoniates	40+10	4	3 hrs.
5.	BOT 2.2	Genetics	40+10	4	3 hrs.
6.	P-102	Practical (2.1& 2.2)	50	8	3 hrs
Total Semester I & II			**300**		

Scheme of B.Sc. II (2017-18)

Semester III					
Sr. No.	Paper code	Nomenclature	Marks+IA	Periods / week	Exam. Duration
1.	BOT 3.1	Biology and Diversity of Seed Plants-I	40+10	4	3 hrs.
2.	BOT 3.2	Plant Anatomy	40+10	4	3 hrs.
3.	P-201	Practical (3.1& 3.2)	50	8	3 hrs
Semester IV					
4.	BOT 4.1	Biology and Diversity of Seed Plants II	40+10	4	3 hrs.
5.	BOT 4.2	Plant Embryology	40+10	4	3 hrs.
6.	P-202	Practical (4.1& 4.2)	50	8	3hrs
Total Semester III & IV			**300**		

Scheme of B.Sc. III (2018-19)

Semester V					
Sr. No.	Paper code	Nomenclature	Marks+IA	Periods / week	Exam. Duration
1.	BOT 5.1	Plant Physiology	40+10	4	3 hrs.
2.	BOT 5.2	Ecology	40+10	4	3 hrs.
3.	P-301	Practical (5.1& 5.2)	50	8	3hrs
Semester VI					
4.	BOT 6.1	Biochemistry & Plant Biotechnology	40+10	4	3 hrs.
5.	BOT 6.2	Economic Botany	40+10	4	3 hrs.
6.	P-302	Practical (6.1& 6.2)	50	8	3hrs
Total Semester V & VI			**300**		
Grand Total Semester I – VI			**900**		

Note: -

- There will be an internal assessment of 20%, in each theory paper.
- I Period =45 minutes
- Practical   examination will be held conducted at the end of each semester.

B.Sc. Botany

SEMESTER-I

PAPER CODE: BOT. 1.1

PAPER –I DIVERSITY OF MICROBES

Internal Assessment-10
Max. Marks – 40
Time- 3 Hours

Note: Attempt five questions in all, selecting one question from each unit.
Question No. 1 is compulsory (short answer type).
Nine questions are to be set spread over the entire syllabus. All questions
carry equal marks.

UNIT-I

Bacteria: Structure, nutrition, reproduction and economic

importance **Cyanobacteria**: General characters; life-history of

Nostoc

Algae: General characters, classification (upto classes) and economic importance;
General account of algal blooms

UNIT II

Important features and life-history (excluding development) of *Volvox*, *Oedogonium*
(Chlorophyceae), *Vaucheria* (Xanthophyceae), *Ectocarpus* (Phaeophyceae) and
Polysiphonia (Rhodophyceae)

UNIT-III

Viruses: General account of Viruses including structure of TMV and Bacteriophages
Fungi: General characters, classification (upto classes) and economic importance;
General account of Lichens

UNIT- IV

Important features and life-history of *Phytophthora* (Mastigomycotina), *Mucor*
(Zygomycotina), *Penicillium* (Ascomycotina), *Puccinia*, *Agaricus* (Basidiomycotina),
Colletotrichum (Deuteromycotina)

B.Sc. Botany

SEMESTER-I

PAPER CODE: BOT. 1.2

PAPER –II CELL BIOLOGY

Internal Assessment-10
Max. Marks – 40
Time- 3 Hours

Note: Attempt five questions in all, selecting one question from each unit.
Question no. 1 is compulsory (short answer type).
Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

The Cell Envelopes: Structure and functions of Cell Wall, Plasma Membrane,

Golgi Apparatus, Endoplasmic Reticulum, Lysosomes, Peroxisomes and Vacuoles

UNIT II

Ultra-structure and function: Chloroplast, Mitochondria, Nucleus and Nucleolus

Chromosome: Morphology, ultra-structure - kinetochore, centromere and telomere

UNIT-III

Cell Cycle: General account

Cell Division: Mitosis and Meiosis - Stages and Significance

UNIT - IV

Chromosomal aberrations: Structural and Numerical - deletions, duplications,

translocations, inversions, aneuploidy, polyploidy

Sex chromosomes and Sex determination in Plants

PRACTICALS
B.Sc. 1ˢᵗ Botany (First Semester)

Diversity of Microbes and Cell Biology (Code: P 101)

Max. Marks: 50   Time allotted: 3 Hours

1. Identify, classify and write short morphological notes giving well labelled relevant diagrams on the given two specimens A, B & C   (15)

2. Prepare smear/squash and find out two different stages of mitosis/meiosis. Identify and show it to the examiners and also give characters of identification.   (12)

3. Identify giving two important characters of identification of the given spots 1, 2, 3,4
   (one slide/ material from virus, bacteria, fungi, lichen).   (8)

4. Field visit and collection records   (5)

5. Practical records   (5)

6. Viva-voce   (5)

SUGGESTED READINGS

Smith, G.M. 1971. Cryptogamic Botany. Vol.I. Algae & Fungi. Tata McGraw Hill Publishing Co., New Delhi.

Sharma, P.D. 1991. The Fungi. Rastogi & Co., Meerut.

Dube, H.C. 1990. An Introduction to Fungi, Vikas Publishing House Pvt.Ltd., Delhi.

Clifton, A. 1958. Introduction to the Bacteria: McGraw Hill & Co., New York.

Alberts, B.Bray, D.Lewis, J., Raff, M.., Roberts, K. and Watson. I.D. 1999. Molecular Biology of Cell. Garland Publishing Co., Inc., New York, USA.

Atherly, A.G. Girton, J.R. and McDonald, J.F. 1999. The Science of Genetics, Saunders College Publising , Fort Worth, USA.

Gupta, P.K. 1999. A text book of Cell and Molelcular Biology. Rastogi Publications, Meerut, India.

B.Sc. Botany
Semester-II

PAPER CODE: BOT. 2.1

PAPER –I DIVERSITY OF ARCHEGONIATES

Internal Assessment-10
Max. Marks – 40
Time- 3 Hours

Note: Attempt five questions in all, selecting one question from each unit. Question No. 1 is compulsory (short answer type).Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

Bryophyta- General characters, classification (upto classes), alternation of generations, evolution of sporophytes and economic importance

UNIT -II

Bryophyta: Structure and reproduction (excluding development) of *Marchantia* (Hepaticopsida), *Anthoceros* (Anthocerotopsida) and *Funaria* (Bryopsida)

UNIT-III

Pteridophyta- General characters, classification (upto classes), alternation of generations, heterospory, apospory, apogamy and economic importance; General account of stellar evolution

UNIT IV

Pteridophyta: Structure and reproduction (excluding development) of *Rhynia* (Psilopsida), *Selaginella* (Lycopsida), *Equisetum* (Sphenopsida) and *Pteris* (Pteropsida)

B.Sc. Botany
SEMESTER-II
PAPER CODE: BOT. 2.2
PAPER –II GENETICS

Internal Assessment-10
Max. Marks – 40
Time- 3 Hours

Note: Attempt five questions in all, selecting one question from each unit.
Question no. 1 is compulsory (short answer type).
Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

Genetic Material: DNA - the genetic material, DNA structure and replication, DNA-Protein interaction, The Nucleosome Model, Genetic Code, Satellite and Repetitive DNA.

UNIT - II

Genetic Inheritance: Mendelism: Laws of Segregation and Independent Assortment; Linkage Analysis; Allelic and non-allelic interactions.

UNIT-III

Extra-nuclear Inheritance: Presence and function of Mitochondrial and Plastid DNA; Plasmids.

Genetic Variations: Mutations - spontaneous and induced; transposable genetic elements; DNA damage and repair.

UNIT - IV

Gene Expression: Modern concept of gene; RNA; Ribosomes; Transfer of genetic information - transcription and translation; Structure of proteins; Regulation of gene expression in prokaryotes and eukaryotes

PRACTICALS

B.Sc. 1st Botany (Second Semester)

Diversity of Archegoniates and Genetics

(Code: P-201)

Max Marks: 50   **Time: 3hrs**

1. Identify, classify and write short morphological notes giving well labelled diagrams on the given two specimens from Bryophytes and Pteridophytes.   (12)

2. One numerical regarding genetics (Mendelian inheritance or gene interaction) as per syllabus.   (12)

3. Identify giving two important characters of identification of the given spots 1, 2, 3,4   (8)

4. Field Visit and collection records   (8)

5. Practical records   (5)

6. Viva-voce   (5)

SUGGESTED READINGS:

Atherly, A.g. Girton, J.R. and McDonald, J.F. 1999. The Science of Genetics, Saunders College Publishing, Fort Worth, USA.

Gupta, P.K. 1999. A text book of Cell and Molecular Biology. Rastogi Publications, Meerut, India

Kleinsmith, L.J. and Kish, V.M. 1995. Principles of Cell and Molelcular Biology (2nd edition). Harper Collins College Publishers, New York, USA.

Lodish, H., Berk, A., Zipursky, S.L., Matudaria, P., Baltimoe, D. and Darnell, J. 2000. Molecular, Cell Biology, W.H. Freeman and Co., New York, USA.

Russel, P.J. 1998. Genetics, The Benjamin/Cummings Publishing Co. Inc., USA.

Snustad, D.P. and Simmons, M.J. 2000. Principles of Genetics. John Wiley and Sons, Inc. USA.

Smith, G.M. 1971. Cryptogamic Botany, Vol.II, Bryophytes & Pteridophytes. Tata McGraw Hill Publishing Co., New Delhi.

Sharma, O.P. 1992. Text Book of Thallophytes, McGraw Hill Publishing Co.

Sharma, O.P. 1990. Text Book of Pteridophyta, Mc Millan India Ltd.

Puri, P., 1980, Bryophyta, Atma Ram & Sons, Delhi.

Russel, P.J. 1998. Genetics, The Benjamin/Cummings Publishing Co. Inc., USA.

Snustad, D.P. and Simmons, M.J. 2000. Principles of Genetics. John Wiley and Sons, Inc. USA.

B.Sc. Botany
SEMESTER-III
PAPER CODE: BOT. 3.1

Paper -I BIOLOGY AND DIVERSITY OF SEED PLANTS –I

Internal Assessment-10
Max. Marks - 40
Time – 3 hrs.

**Note : Attempt five questions in all, selecting one question from each unit.
Question No.1 is compulsory (short answer type).
Nine questions are to be set spread over the entire syllabus. All
questions carry equal marks.**

UNIT-I
General characters, origin and evolution ofGymnosperms
Geological Time Table; Evolution of Seed Habit.
Pilger and Melchior's (1954) system of classification of Gymnosperms.

UNIT-II
Palaeobotany- Fossils and Fossilization (Process involved, types of fossils and importance of fossils);
Reconstruction of the following fossil plants:
>   *Lyginopteris*
>   *Williamsonia*
>   *Cycadeoidea (= Bennettites*)

UNIT-III
Morphology and anatomy of root, stem, leaf/leaflet and reproductive parts including mode of reproduction, life-cycle and economic importance of following plants:
Cycas
Pinus

UNIT-IV
Morphology and anatomy of root, stem, leaf/leaflet and reproductive parts including mode of reproduction, life-cycle and economic importance of *Ephedra*
Economic importance of Gymnosperms
General characters, origin and evolution of Angiosperms

B.Sc. Botany
SEMESTER-III
PAPER CODE: BOT. 3.2
PAPER-II PLANT ANATOMY

Internal Assessment-10
Max. Marks - 40
Time – 3 hrs.

Note : Attempt five questions in all, selecting one question from each unit.
Question No.1 is compulsory (short answer type).
Nine questions are to be set spread over the entire syllabus. All
questions carry equal marks.

UNIT-I

Tissues - meristematic and permanent (simple, complex and
secretory) Tissue systems (Epidermal, ground and vascular)
The Shoot system - shoot apical meristem and its histological
organizations.

UNIT-II

Cambium - structure and functions.
Secondary growth in dicot stem; characteristics of growth rings; sap wood
and heart wood, periderm;
Anomalous secondary growth (*Dracaena, Boerhaavia* and *Achyranthes*)

UNIT-III

Leaf: Types of leaves (simple and compound); phyllotaxy. Epidermis-
uniseriate and ultiseriate, epidermal appendages and their morphological
types.
Anatomy of typical Monocot and Dicot leaf and cell inclusions in leaves,
leaf abscission, Stomatal apparatus and their morphological types

UNIT-IV

Root system: Root apical meristem; histological organization
Secondary growth in dicot root.
Structural modifications in roots: Storage (*Beta*), Respiratory
(*Rhizophora*), Epiphytic (*Vanda*).

PRACTICALS

B.Sc. IInd Botany (Third Semester)

Biology & Diversity of Seed Plants-I and Plant Anatomy(Code: P 301)

Max. Marks: 50   **Time : 3Hours**

1.   Cut the section of given material A and prepare a double-stained permanent mount of the given material. Identify giving reasons and show it to the
examiner.   (10)

2   Identify, classify and write morphological notes on the given material/specimens B & C from Gymnosperms.   (10)

3   Identify, giving the important characters of identification of the spots/specimen 1 and 2 from Gymnosperms and 3 and 4 from angiosperms   (10)

4   Filed visit and collection records.   (10)

5   Note-book   (5)

6   Viva-voce   (5)

Suggested Readings

Bhatnagar, S. and Moitra, A. 1996. Gymnosperms. New Age International Limited, New Delhi.

Davis, P.H. and Heywood, V.H. 1963. Principles of Angiosperms Taxonomy, Oliver and Boyd. London.

Gifford, E.M. and Foster, A.S. 1988. Morphology and Evolution of Vascular Plants, W.H. Freeman & Company, New York.

Heywood, V.H. and Moore, D.M. (eds) 1984. Current concepts in Plant Taxonomy. Academic Press, London.

Jeffrey, C. 1982. An introduction to Plant Taxonomy. Cambridge University Press, Cambridge, London.

Jones, S.B. , Jr. Luchsinger, A.E. 1986. Plants Systematics 2nd edition).
McGraw Hill Book Co. New York.

Maheshwari, J.K. 1963. Flora of Delhi, CSIR, New Delhi.

Radford, A.E. 1986. Fundamentals of Plant Systamtics. Harper and Row,
New York.

Singh, G. 1999. Plant Systematics: Theory and Practical. Oxford and IBH
Pvt. Ltd., New Delhi.

Sporn, K.R. 1965. The Morphology of Gymnsperms. Hutchinson & Co.
Ltd., London.

Stace, C.A. 1989. Plant Taxonomy and Biosystematics (2nd edition).
Edward Arnold, London.

Steward, W.M. Paleobotany and the Evolution of Plants. Cambridge
University Press, Cambridge.

B.Sc. Botany

SEMESTER- IV

PAPER CODE: BOT. 4.1

PAPER-I BIOLOGY AND DIVERSITY OF SEED PLANTS-II

Internal Assessment-10

Max. Marks - 40

Time – 3 hrs

Note: Attempt five questions in all, selecting one question from each unit. Question No.1 is compulsory (short answer type).Nine questions are to be set spread over the entire syllabus. All questions carry equal marks

UNIT-I

Taxonomy and Systematics, fundamental components of taxonomy (identification, classification, description, nomenclature and phylogeny), Role of chemotaxonomy, cytotaxonomy and taximetrics in relation to taxonomy, Botanical Nomenclature, principles and rules, principle of priority, Keys to identification of plants.

UNIT-II

Type concept, taxonomic ranks, Salient features of the systems of classification of angiosperms proposed by Bentham & Hooker and Engler & Prantl, Floral Terms and Types of Inflorescence

UNIT-III

Diversity of Flowering Plants: Diagnostic features and economic importance of the following families: Ranunculaceae, Brassicaceae, Malvaceae, Euphorbiaceae, Rutaceae, Fabaceae, Cucurbitaceae

UNIT-IV

Diversity of Flowering Plants: Diagnostic features and economic importance of the families: Apiaceae, Asclepiadaceae, Lamiaceae, Solanaceae, Asteraceae, Liliaceae and Poaceae

B.Sc. Botany

SEMESTER- IV

PAPER CODE: BOT. 4.2

PAPER-II PLANT EMBRYOLOGY

Internal Assessment-

10 Max. Marks - 40

Time – 3 hrs.

Note : Attempt five questions in all, selecting two questions from each unit. Question No.1 is compulsory (short answer type). Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

Flower-a modified shoot, Microsporangium, its wall and dehiscence mechanism.

Microsporogenesis, pollen grains and its structure (pollen wall).

UNIT -II

Pollen germination (microgametogenesis), Male gametophyte, Pollen-pistil interaction; self incompatibility, Pollination: types and agencies

UNIT-III

Structure of Megasporangium (ovule), its curvatures; Megasporogenesis and Megagametogenesis,Female gametophyte (mono, bi and tetrasporic), Double fertilization,Endosperm types and its biological importance.

UNIT-IV

Embryogenesis in Dicot and Monocot; Polyembryony, Structure of Dicot and Monocot seed, Fruit types; Dispersal mechanisms in fruits and seeds.

PRACTICALS

B.Sc. IInd Botany (Fourth Semester)

Max. Marks: 50   Time: 3Hours

1   Describe/compare the given flowers A and B in semi-technical language giving V.S. of flowers, T.S. of ovaries, floral diagrams and Floral Formulae. Identify and assign them to their respective families giving reasons. (12)

2   Dissect out the globular/heart-shaped embryo from the given material. (10)

3   Identify, giving the important characters of identification of the spots 1, 2 and 3 from embryology   (9)

4   Field visit and collection records.   (9)

5   Practical records   (5)

6   Viva-voce   (5)

Suggested Readings

Bhojwani, S.S. and Bhatnagar, S.P. 2000. The Embryology of Angiosperms. 4th revised and enlarge edition. Vikas Publishing House, Delhi.

Cutter, E.G. 1969. Plant Anatomy Part-I, Cells and Tissues, Edward Arnold, London.

Cutter, E.G. 1971. Plant Anatomy: Experiment and Interpretation. Part-II Organs, Edward Arnold London.

Esau, K. 1977. Anatomy of Seed Plants, 2nd edition. John Wiley & Sons, New York.

Fageri, K and Van der Pijl 1979. The Principles of Pollination Ecology. Pergamon Press, Oxford.

Fahn, A. 1974. Plant Anatomy, 2nd Edition. Pergamon Press, Oxford.

Hartmann, H.T. and Kestler, D.E. 1976. Plant Propagation; Principles and Practices. 3rd edition. Prentice Hall of India Pvt. Ltd. New Delhi

King. J. 1997. Reaching for the Sun: How Plants Works. Cambridge University Press, Cambridge, U.K.

Mauseth, J.D. 1988. Plant Anatomy. The Benjamin/Cummings Publishing Company
    Inc. Menlo Park, California, USA.

Proctor, M and Yeo, P. 1973. The Pollination of Flowers. William Collins Sons,
London.

Raven, P.H. Evert, R.F. and Eichhorn, S.E. 1999. Biology of Plants. 5th edition. W.R.
    Freeman and Co., Worth Publishers, New York.

Thomas, P. 2000. Trees: Their Natural History. Cambridge University Press, Cambridge.

B. Sc. III (Botany) Syllabus

PAPER CODE: BOT. 5.1

SEMESTER-V

Paper – I Plant Physiology

Internal Assessment-
10 Max. Marks – 40
Time – 3 hrs.

Note: Five questions to be attempted in all, selecting one question from each unit.
Question No. 1 will be compulsory (short answer type).
Nine questions are to be set spread over the entire
syllabus. All questions carry equal marks.

UNIT-I

Plant-water relations: Importance of water to plant life; physical properties of water; imbibition, diffusion and osmosis; absorption and transport of water; transpiration; physiology of stomata.

Mineral nutrition: Essential macro and micro elements and their role; mineral uptake; deficiency symptoms.

UNIT -II

Transport of organic substances: Mechanism of phloem transport; source-sink relationship; factors affecting translocation.

Photosynthesis : significance; historical aspects; photosynthetic pigments; action spectra and enhancement effects; concept of two photosystems; Z-scheme; photo-phosphorylation; Calvin cycle; C4 pathway; CAM plants; photorespiration.

UNIT-III

Growth and development : Definitions; phases of growth and development; seed dormancy; plant movements; the concept of photoperiodism; physiology of flowering; florigen concept; physiology of senescence; fruit ripening;

UNIT -IV

Plant hormones- auxins, gibberellins, cytokinins, abscissic acid and ethylene, history of their discovery, mechanism of action; photo-morphogenesis;

Phytochromes and their discovery, physiological role and mechanism of action.

Suggseted Readings:

1. Dennis,D.T., Turpin, D.H., Lefebvre,D.D. and Layzell (eds.). 1997: Plant Metabolism (2nd Edition), Longman, Essex, England.
2. Galston, A.W. 1989: Life Processes in Plants, Scientific American Library, Springer-Verlag, New York, USA.
3. Hopkins, W.G., 1995: Introduction to Plant Physiology, John Wiley & Sons, Inc., New York, USA.
4. Mohr, H. and Schopfer, P. 1995: Plant Physiology. Springer-Verlag, Berlin Germany.

PAPER CODE: BOT. 5.2

Paper - II Ecology

Internal
Assessment-10
Max. Marks – 40
Time – 3 hrs.

Note: Five questions to be attempted in all, selecting two questions from each unit. Question No. 1 will be compulsory (short answer type). Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I
Introduction to Ecology: Definition; scope and importance; levels of organization .
Environment: Introduction; environmental factors- climatic (water, humidity, wind, light, temperature), edaphic (soil profile, physico-chemical properties), topographic and biotic factors (species interaction).

UNIT-II
Adaptations of plants to water stress and salinity (morphological and anatomical features of hydrophytes, xerophytes and halophytes).
Population ecology: Basic concept; characteristics; biotic potential, growth curves; ecotypes and ecads.

UNIT-II
Community ecology: Concepts; characteristics (qualitative and quantitative analytical and synthetic); methods of analysis; ecological succession.
Ecosystem: Structure (components) and functions (trophic levels, food chains, food webs, ecological pyramids and energy flow)
Biogeochemical cycles: Carbon, nitrogen, phosphorus and hydrological cycle.

UNIT-IV
Phyto-geography: Phyto- geographical regions of India; vegetation types of India (forests). Environmental pollution: Sources, types and control of air and water pollution.
Global change: Greenhouse effect and greenhouse gases; impacts of global warming; carbon trading; Ozone layer depletion; Biomagnification

Suggested Readings:
1. Odum, E.P. 1983: Basic Ecology, Saunders, Philadelphia.
2. Kormondy, E.J. 1996: Concepts of Ecology, Prantice-Hall of India Pvt. Ltd., New Delhi.
3. Mackenzie, A. et al. 1999: Instant Notes in Ecology, Viva Books Pvt. Ltd., New Delhi.

Semester V

Practical

Plant Physiology and Ecology (P-501)

Max. Marks: 50   **Time: 3hrs.**

1. Devise an experiment to demonstrate the physiological process (As per list).Perform it and show it to the examiner.	12
2. Comment on physiological experiment (Specimen set up/ model/chart).	10
3. Ecological experiment/ecological specimen (As per list)	12
4. Note Book, Collection and field report	10
5. Viva-voce	6

B.Sc. Botany

SEMESTER-VI

PAPER CODE: BOT. 6.1

Paper – I Biochemistry and PlantBiotechnology

Internal Assessment-10

Max. Marks –40

Time – 3 hrs

Note: Five questions to be attempted in all, selecting two questions from each unit.

Question No. 1 will be compulsory (short answer type). Nine questions are to be set
spread over the entire syllabus. All questions carry equal marks.

UNIT-I

Basics of Enzymology: Discovery and nomenclature; characteristics of enzymes; concept of holoenzyme, apoenzyme, coenzyme and co-factors; regulation of enzyme activity; mechanism of action.

UNIT-II

Respiration: ATP – the biological energy currency; aerobic and anaerobic respiration; Krebs cycle; electron transport mechanism (chemiosmotic theory); redox -potential; oxidative phosphorylation; pentose phosphate pathway.

UNIT-III

Lipid metabolism: Structure and functions of lipids; fatty acid biosynthesis; β-oxidation; saturated and unsaturated fatty acids; storage and mobilization of fatty acids.

Nitrogen metabolism: Biology of nitrogen fixation; importance of nitrate reductase and its regulation; ammonium assimilation.

UNIT-IV

Genetic engineering and Biotechnology: Tools and techniques of recombinant DNA technology; cloning vectors; genomic and cDNA library; transposable elements; aspects of plant tissue culture; cellular totipotency, differentiation and morphogenesis; biology of *Agrobacterium*; vectors for gene delivery and marker genes.

Suggested Readings:

1. Bhojwani, S.S. 1990: Plant Tissue Culture Applications and Limitations. Elsevier Science Publishers, New York, USA.
2. Lea, P.J. and Leegood, R.C. 1999:Plant Biochemistry and Molecular Biology, John Wiley & Sons, Chichester, England.
3. Old, R.W. and Primrose, S.B. 1989: Principles of Gene Manipulation, Blackwell Scientific Publications, Oxford, UK.
4. Raghavan, V. 1986: Embryogenesis in Angiosperms: A Developmental and Experimental Study, Cambridge University Press, New York, USA.

PAPER CODE: BOT. 6.2

Paper – II Economic Botany

Internal Assessment-10

Max. Marks – 40   Time – 3 hrs.

Note: Five questions to be attempted in all, selecting two questions from each unit.

Question No. 1 will be compulsory (short answer type). Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

Vavilov's centres of origin of crop plants, Origin, distribution, botanical description, brief idea of cultivation and economic uses of the following:

Food plants - cereals (rice, wheat and maize), pulses (gram, arhar and pea), vegetables (potato, tomatoand onion).

UNIT-II

Origin, distribution, botanical description, brief idea of cultivation and economic uses of the following:

Fibers- cotton, jute and flax.

Oils- groundnut, mustard, sunflower and coconut.

UNIT-III

Morphological description, brief idea of cultivation and economic uses of the following:

Spices- coriander, ferula, ginger, turmeric, cloves.

Medicinal plants- *Cinchona, Rauwolfia, Atropa, Opium, Cannabis, Azadirachta, Withania*.

UNIT-IV

Botanical description, processing and uses of:

Beverages- tea and coffee;

Rubber - *Hevea*;

Sugar- sugarcane

General account and sources of timber; energy plantations and bio-fuels.

Semester VI

Practical

Biochemistry, Biotechnology and Economic Botany (P-601)

Max. Marks: 50

Time: 3 hrs.

1. Device an experiment to test the carbohydrate/protein/fats/peroxidase activity.
   Perform it and show it to the examiner.   10

2. Perform /Comment on Biotechnological experiment   12
       (As per list).

3. Identify and classify spots1,2,3 & 4 from the point of view of
   economic important and morphology of the plant part used   12

4. Note Book, Collection and field report.   10

5. Viva-voce   6

Suggested Readings:

1. Kocchar, S.L. 1998: Economic Botany in Tropics, 2nd edition, MacMillan India Ltd., New Delhi.
2. Sambammurthy, A.V.S.S. And Subramanyam, N.S. 1989: A Textbook of Economic Botany, Wiley Eastern Ltd., New Delhi.
3. Sharma, O.P. 1996: Hills Economic Botany (Late Dr. A.F. Hill adapted by O.P. Sharma), Tata McGraw Hill Co. Ltd., New Delhi.
4. Simpson, B.B. and Conner-Ogorzaly, M. 1986: Economic Botany- Plants in Our World, McGraw Hill, New York

SCHEME OF EXAMINATION FOR B.Sc. (ZOOLOGY) SEMESTER SYSTEM
w.e.f. Session 2016-17

B.Sc. I

Sr. No.	Paper code	Nomenclature		Marks+IA	Periods / week	Exam. Duration
		Semester I				
1.	1.1	Life and Diversity from Protozoa to Helminthes		40+10	4	3 hrs.
2.	1.2	Cell Biology		40+10	4	3 hrs.
3.	P-101	Practical (1.1 &1.2)		50	6&6 (6 periods per group per week)	3 hrs.
		Semester II				
4.	2.1	Life and Diversity from Annelida to Hemichordata		40+10	4	3 hrs.
5.	2.2	Genetics		40+10	4	3 hrs.
6.	P-201	Practical (2.1 & 2.2)		50	6&6 (6 periods per group per week)	3 hrs.
Total Semester I & II				**300**		

B.Sc. II

Sr. No.	Paper code	Nomenclature		Marks+IA	Periods / week	Time
		Semester III				
1.	3.1	Life and Diversity of Chordates – I		40+10	4	3 hrs.
2.	3.2	Mammalian Physiology – I		40+10	4	3 hrs.
3.	P-301	Practical (3.1 & 3.2)		50	6&6 (6 periods per group per week)	3 hrs.
		Semester IV				
4.	4.1	Life and Diversity of Chordates – II		40+10	4	3 hrs.
5.	4.2	Mammalian Physiology – II		40+10	4	3 hrs.
6.	P-401	Practical (4.1 & 4.2)		50	6&6 (6 periods per group per) week	3 hrs.
Total Semester III & IV				**300**		

B.Sc. III

Semester V						
Sr. No.	Paper code	Nomenclature		Marks+IA	Periods / week	Time
1.	5.1	Fish and fisheries		40+10	4	3 hrs.
2.	5.2	Ecology & Evolution		40+10	4	3 hrs.
3.	P-501	Practical (5.1&5.2)		50	6&6 (6 periods per group per week)	3 hrs.
Semester VI						
4.	6.1	Entomology		40+10	4	3 hrs.
5.	6.2	Developmental Biology		40+10	4	3 hrs.
6.	P-601	Practical (6.1&6.2)		50	6&6 (6 periods per group per week)	3 hrs.
Total Semester V & VI				**300**		
Grand Total Semester I – VI				**900**		

Note: -

- There will be an internal assessment, in each theory paper, inclusive of 20% of total marks i.e. 40+10
- #1Period=45 minutes
- Conduction of Practical Exams will be held Semester-wise

PAPER – 1.1
LIFE AND DIVERSITY FROM PROTOZOA TO HELMINTHES

Max Marks: 40+10 (Internal assessment)   **Time allotted: 3 Hours**

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.
1. Question number I is compulsory consisting of 8 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

UNIT-1
Phylum- Protozoa
   i)   General characters and classification up to order level
   ii)   Biodiversity and economic importance
   iii)   Type study of *Plasmodium;*
   iv)   Parasitic protozoans: Life history, mode of infection and pathogenicity of *Entamoeba, Trypanosoma, Leishmania* and *Giardia.*

UNIT-II
Phylum- Porifera:
   i)   General characters and classification up to order level
   ii)   Biodiversity and economic importance
   iii)   Type study - *Sycon.*
   iv)   Canal system in sponges
   v)   Spicules in sponges

UNIT-III
Phylum - Coelentrata:
   i)   General characters and classification up to order level
   ii)   Biodiversity, economic importance
   iii)   Type Study - *Obelia*
   iv)   Corals and coral reefs
   v)   Polymorphism in Siphonophores

UNIT-IV

Phylum - Helminths:
   i)   General characters and classification up to order level
   ii)   Biodiversity, economic importance
   iii*)*   Type study - *Fasciola hepatica*
   iv)   Helminths parasites: Brief account of life history, mode of infection and pathogenesity of Schistosoma*, Ancylostoma, Trichinella, Wuchereria* and *Oxyuris.*

PAPER- 1.2
CELL BIOLOGY

Max Marks: 40+10 (Internal assessment)   **Time allotted: 3 Hours**

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.
1. Question number I is compulsory consisting of 8 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

UNIT-I

1. Ultrastructure of different cell organelles of animal cell.
2. Plasma Membrane: Fluid mosaic model, various modes of transport across the membrane, mechanism of active and passive transport, endocytosis and exocytosis.
3. Endoplasmic reticulum (ER): types, role of ER in protein synthesis and transportation in animal cell.
4. Goigi complex: Structure, Associated enzymes and role of golgi-complex in animal cell.

UNIT-II

1. Ribosomes: Types, biogenesis and role in protein synthesis.
2. Lysosomes: Structure, enzyme and their role; polymorphism
3. Mitochondria: Mitochondrial DNA; as semiautonomous body, biogenesis, mitochondrial enzymes (only names), role of mitochondria.
4. Cytoskeleton: Microtubules, microfilaments, centriole and basal body.
   5 Cilia and Flagella

UNIT-III

1. Ultrastructure and functions of Nucleus: Nuclear· membrane, nuclear lamina, nucleolus, fine structure of chromosomes, nucleosome concept and role of histones,
2. Euchromatin and heterochromatin, lampbrush chromosomes and polytene chromosomes.

UNIT-IV

1. Mitosis and Meiosis (Cell reproduction)
2. Brief account of causes of cancer.
3. An elementary idea of cellular basis of Immunity.

PRACTICAL (P-101)

Max. Marks:50   **Time allowed: 3Hrs**

(A) Classification up to orders with ecological note and economic importance of the following animal:

I. Protozoa	Lamination of cultures of *Amoeba, Euglena* and *Paramecium;* permanent prepared slides: *Amoeba, Euglena, Trypanosoma, Noctiluca, Eimeria, Paramecium* (binary fission and conjugation), *Opalina, Verticella, Balantidium, Nyctotherus,* radiolarian and formaniferan ooze.
2. Parazoa (Porifera)	Specimens: *Sycon. Grantia, Euplectella, Hyalonema, Spongilla, Euspongia*
3. Coelenterata.	Specimens: *Porpita, Valella, Physalia, Aurelia, Rhyzostoma, Metridium, Millipora, Alcyonium, Tubipora, Zoanthus, Madrepora, Favia, Fungia,* and *Astrea,* Permanent prepared slides: *Hydra* (W.M.), *Hydra* with buds, *Obelia* (colony and medusa), *Sertularia, Plumularia, Tubularia, and Bougainvillea, Aurelia* (sense organs and stages of life history).
4. Platyhelminthes	Specimens: *Dugesia, Fasciola, Taenia, Echinococus,* Permannt prepared slides: *Miracidium, sporocyst, redia, cercaria, scolex* and *proglotttids; Taenia* (mature and gravid).
5. Aschelminthes	*Ascaris* (male & female), *Trichinella, Ancylostoma, Meloidogyne.*

(B) Study of the following permanent stained preparations:
  I. L.S. and TS. *Sycon;* gemmules, spicules and sponging fibres of *Sycon,* canal system of sponges.
  2. TS. *Hydra* (testis and ovary region).
  3. T.S. *Fasciola* (different regions).
  4. T.S. *Ascaris* (male and female).

 (C) **Preparation of the following slides:**
  1. Temporary preparation of *Volvox, Paramecium,* Gemmules and spicules of *Sycon*
  2. Preparation of permanent stained whole mounts of *Hydra, Obelia, Sertularia, Plumularia* and *Bougainvillea.*
  3. Pathogenic protozoans: Plasmodium, Giardia or as available
  4. Pathogenic Helminthes: Ancylostma; Wuchereria or as available

 (D) **Cell biology and Genetics:**
  I. Cell division: Prepared slides of stages of mitosis and meiosis.
  2.   Temporary squash preparations of onion root tip / grasshopper testis for the study of mitosis using acetocarmine stain.

(E) **Project:**
  1. Parasitic adaptations (Protozoa to helminthes)
  2. DNA: types, structure and its model preparation
  3. Survey- Diversity of particular family/taxa in your surrounding area
  4. Microscopy: principles and its significance
  5. Staining techniques and their significance

(F) **Disaster Management Project Work: (Field Work, Case Studies)**
     For details see the UGC Website

PAPER – 2.1
LIFE AND DIVERSITY OF ANNELIDA TO HEMICHORDATA

Max Marks: 40+10   (Internal assessment)   **Time allotted: 3 Hours**

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.

1. Question number I is compulsory consisting of 8 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.

2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

UNIT-I

 Phylum - Annelida:
i)   General characters and classification up to order level
ii) Biodiversity and economic importance of Annelida
iii) Type study - *Pheretima* (Earthworm)
iv) Metamerism in Annelida
         v) Trochophore larva:. Affinities, evolutionary significance

UNIT-II

 Phylum - Arthropoda:
i) General characters and classification up to order level
ii) Biodiversity and economic importance of insects
iii) Type study – *Periplaneta*

UNIT-III

 Phylum - Mollusca:
i)   General characters and classification up to order level
ii) Biodiversity and economic importance
iii) Type study - *Pila*
iv) Torsion and detorsion in gastropoda
v)   Respiration and foot

UNIT-IV

 Phylum - Echinodermata:
i)   General characters and classification up to order level
ii) Biodiversity and economic importance
iii) Type Study -*Asteries* (Sea Star)
iv) Echinoderm larvae
 v) Aristotle's Lantern

Phylum – Hemichordata:
Type study: *Balanoglossus*

PAPER – 2.2
GENETICS

Max Marks: 40+10 (Internal assessment)   **Time allotted: 3 Hours**

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.

1. Question number I is compulsory consisting of 8 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

UNIT-I

1. Elements of Heredity and variations.
2. The varieties of gene interactions
3. Linkage and recombination: Coupling and repulsion hypothesis, crossing-over and chiasma formation; gene mapping.

UNIT-II

1. Sex determination and its mechanism: male and female heterozygous systems, genetic balance system; role of Y -chromosome, male haploidy, cytoplasmic and environmental factors, role of hormones in sex determination.
2. Sex linked inheritance: Haemophilia and colour blindness in man, eye colour in *Drosophila*, Non-disjunction of sex-chromosome in *Drosophila*; Sex-linked and sex influenced inheritance.
3. Extra chromosomal and cytoplasmic inheritance:
   - i)   Kappa particles in Paramecium.
   - ii)   Shell coiling in snails.
   - iii) Milk factor in mice.

UNIT-III

1. Multiple allelism: Eye colour in Drosophila; A, B, 0 blood group in man.
2. Human genetics: Human karyotype, Chromosomal abnormalities involving autosomes and sex chromosomes, monozygotic and dizygotic twins.
3. Inborn errors of metabolism (Alcaptonuria, Phenylketonuria, Albinism, sickle-cell anaemia).

UNIT-IV

1. Nature and function of genetic material; Structure and type of nucleic acids; Protein synthesis. spontaneous and induced (chemical and radiations) mutations; gene mutations; chemical basis of mutations; transition, transversion, structural chromosomal aberrations (deletion, duplication, inversion and translocation); Numerical aberrations (autoploidy, euploidy and polyploidy in animals)
2. Applied genetics**:** Eugenics, euthenics and euphenics; genetic counseling, pre-natal diagnostics, DNA-finger printing, transgenic animals

PRACTICAL (P-102)

Max. Marks:50   **Time allowed: 3Hrs**

(A) Classification up to orders with ecological note and economic importance of the following group of animals:
1. Annelida Specimens:Pheretima, Heteronereis, Polynoe, Aphrodite, Chaetopterus, Arenicola, Tubifex and Pontobdella.
2. Arthropoda Specimens: Peripatus, Palaemon (Prawn), Lobster, Cancer (crab), Sacculina, Eupagurus (hermit crab), Lepas, Balanus, Cyclops, Daphnia, Lepisma, Periplaneta (cockroach), Schistocerca (locust), Poecilocerus (ak-hopper), Gryllus (cricket), Mantis (praying mantis),Cicada, Forticula (earwig), Dragon fly, termite queen, bug, moth, beetle, Polistes (wasp), Apis (honey bee), Bombyx (silk moth), Cimex (begbug), Pediculus (body louse). Millipedes, Scolopendra (centipedes), Palamnaeus (scorpion), Aranea (spider), Limulus (king crab).
3. Mollusca Specimens: Mytilus, Ostrea, Cardium, Pholas, Solen
(razor fish), Pecten, Holiotis, Patella, Aplysia, Doris, Limax, Loligo, Sepia, Octopus, Nautilus (complete and T.S.), Chiton and Dentalium.
4. Echinodermata Specimens: Asterias, Echinus, Cucumara, Ophiothrix, Antedon and Asterophyton.
5. Hemichordata Balanoglossus
(B) Study of the following permanent stained preparations:
1. T.S. Pheretima (pharyngeal and typhlosolar regions), Setae, septal nephridia and spermathecae of Pheretima.
2. Trachea and mouthpmts of cockroach.
3.Statocyst of Palaemon.
4. Glochidium larva of Anodonta; radula and osphradium of Pila.
5. T.S. Star fish (arm)
6. T.S. Balanoglossus (through various regions).
(C)Demonstration by C. D.:
1 . Mouth parts and trachea of Periplanata (cockroach), radula of Pila; pedicillarae of Asterias.
2. setae of earthworm, and mouth parts of Honey bee, House fly and cockroach.
(D) Preparation of models of the different systems of the following animals:
1. Earthworm: Digestive, reproductive and nervous systems.
2. Grasshopper/ cockroach: Digestive, reproductive and nervous systems.
3. Pila: Pallial complex, digestive and nervous systems
(E) Cell biology and Genetics:
1. Salivary gland and polytene chromosomes of Drosophila/Chironomus.
2. Numericals based on three point test cross
(F) Project:
1. Survey- Diversity of particular family/taxa in your surrounding area
2. Vermicomposting: Earthworm rearing and economics of the project
3. Evolutionary significance of larvae belonging to different group of invertebrates

B.Sc. PART- I (Zoology Practical)
(Semester I & II)
Guidelines/Instructions for Practical Examination
P-101 and P-201

Max Marks: 50+50   **Time allowed: 3+3 Hrs**

Note: Following exercises will be set in the examination as per marks assigned

S. No.	Exercise	Marks	
		P-101	**P-201**
1.	Dissection	x	3
	(Exposition, labelled diagram)	x	
2.	Temporary mounting –one	3	3
	(Staining, identification, sketch)		
3.	Museum specimens - four	12	12
	(identification and classification)		
4.	Ecological note –one specimen	3	3
5.	Permanent slides - two	4	4
	(Identification with reasons)		
6.	Preparation of chromosome slide	4	4
	(root tip/grasshopper testis)		
7.	Invertebrate collection and report	4 (2+2)	4 (2+2)
8.	Practical record and slides	7 (5+2)	7 (5+2)
9.	Viva	5	5
10	Project report	8	5

SYLLABUS (B.Sc.- ZOOLOGY)
w.e.f. Session 2016-17
B. Sc. SEMESTER – III

PAPER 3.1

LIFE AND DIVERSITY OF CHORDATES – I

Max Marks: 40+10   (Internal assessment)   **Time allotted: 3 Hours**

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.

1. Question number I is compulsory consisting of 10 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.

2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

UNIT-I

Chordates:
Principles of classification; Origin and Evolutionary tree;
Role of amnion in evolution; Salient features of chordates;
Functional morphology of the types with examples emphasizing their biodiversity,
economic importance and conservation measures where required.

UNIT-II

General characters and classification of phyla upto orders with examples emphasizing their biodiversity,
economic importance and conservation measures where required.

Protochordates: Systematic position, distribution, ecology, morphology and affinities
       Urochordata: *Herdmania* – type study
       Cephalochordata; *Amphioxus* – type study

UNIT-III

General characters and classification of phyla upto orders with examples emphasizing their biodiversity,
economic importance and conservation measures where required.

Cyclostomes: Classification and ecological significance
       Type study of *Petromyzon.*

UNIT-IV

General characters and classification of all phyla upto orders with examples emphasizing their biodiversity,
economic importance and conservation measures where required.

Pisces: Scales & Fins, Parental care in fishes, fish migration.
       Types study of Labeo

Note: Type study includes detailed study of various systems of the animal.

SYLLABUS (B.Sc.- ZOOLOGY)
w.e.f. Session 2016-17
B. Sc. SEMESTER – III

PAPER 3.2

MAMMALIAN PHYSIOLOGY – I

Max Marks: 40+10 (Internal assessment)   **Time allotted: 3 Hours**

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.

1. Question number I is compulsory consisting of 10 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

UNIT-I
Introduction, Classification, Structure, function and general properties of carbohydrates and lipids.
UNIT-II
Introduction, Classification, Structure, function and general properties of proteins; Nomenclature, Classification and mechanisms of enzyme action.
Transport through biomembranes (Active and Passive), buffers
UNIT-III
Nutrition: Nutritional components; Carbohydrates, fats, lipids, Vitamins and Minerals. Types of nutrition & feeding, Digestion of dietary constituents, viz. lipids, proteins, carbohydrates & nucleic acids; symbiotic digestion. Absorption of nutrients & assimilation; control of enzyme secretion.
UNIT-IV
Muscles: Types of muscles, ultra-structure of skeletal muscle. Bio-chemical and physical events during muscle contraction; single muscle twitch, tetanus, muscle fatigue muscle, tone, oxygen debt., Cori's cycle, single unit smooth muscles, their physical and functional properties.
Bones: Structure and types, classification, bone growth and resorption, effect of ageing on skeletal system and bone disorders.

SYLLABUS (B.Sc.- ZOOLOGY)
w.e.f. Session 2016-17
B. Sc. SEMESTER – III

PRACTICAL (P-301)

Max. Marks:50   **Time allowed: 3Hrs**
1. **Classification upto orders, habit, habitats, external characters and economic importance (if any) of the following animals:-**
    Protochordata   :   *Molqula, Hetryllus, Pyrosoma, Doliolum, Olikopleura,* and *Amphioxus.*
    Cyclostomata   :   *Myxine, Petromyzon* and *Ammocoetus larva.*
    Chondrichthyes: *Zygaena, Pristis, Narcine* (electric ray), *Trygon, Rhinobatus, Raja* and *Chimaera.*
    Osteichthyes   :   *Acipenser, Lepidosteus, Muraena, Mystus, Catla, Hippocampus, Syngnathus, Exocoetus, Anabas, Diodon, Ostraczion, Tetradon, Echinus, Lophius, Solea* and *Polypterus.* Any of the Lung Fishes.

2. **Preparation of models of the different systems of the following animals:**
    Herdmania: General anatomy
    Labeo (locally available fish): Digestive and reproductive systems: cranial nerves

3. **Study of the skeleton of *Scoliodon, Labeo***

4. **Study of the following prepared slides:** Tornaria larva, T.S. *Amphioxus* (through different regionds). Oikopleura, different types of scales.

5. **Make permanent stained preparations of the following**: *Salpa,* Spicules, and Cycloid scales

6. **Zoological excursion and its report**

    PHYSIOLOGY PRACTICALS:
    1.   Qualitative tests for identification of simple sugars, disaccharides and polysaccharides.
    2.   Study of human salivary amylase activity: Effect of temperature, pH, Concentration.

    Project Report:
        1. Migration in fishes
        2. Ornamental fishes

7. **Disaster Management Project Work: (Field Work, Case Studies.** for details see the UGC Website

PAPER 4.1
LIFE AND DIVERSITY OF CHORDATES – II

Max Marks: 40+10 (Internal assessment)   **Time allotted: 3 Hours**

 Note: Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.

1. Question number I is compulsory consisting of 10 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

UNIT-I
Amphibia: Origin, Evolutionary tree. Type study of frog (*Rana tigrina*), Parental Care in Amphibia

UNIT-II
Reptilia: Type study of Lizard (Hemidactylus), Origin, Evolutionary tree. Extinct reptiles; Poisonous and non-poisonous snakes; Poison apparatus in snakes.

UNIT-III
Aves: Type study of Pigeon (*Columba livia*); Flight adaptation, Principles of aerodynamics in Bird flight, migration in birds.

UNIT-IV
Mammals: Classification, type study of Rat; Adaptive radiations of mammals and dentition.
Note: Type study includes detailed study of various systems of the animal.

SYLLABUS (B.Sc.- ZOOLOGY)
w.e.f. Session 2016-17
B. Sc. SEMESTER – IV

PAPER 4.2
MAMMALIAN PHYSIOLOGY – II
Max Marks: 40+10 (Internal assessment)   **Time allotted: 3 Hours**

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including compulsory question.

1. Question number I is compulsory consisting of 10 parts (1.0 mark each) covering the entire syllabus. Answer to each part should not exceed 20 words.

2. Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidate is required to attempt four questions, selecting one question from each unit.

UNIT-I
Circulation: Origin, conduction and regulation of heart beat, cardiac cycle, electrocardiogram, cardiac output, fluid pressure and flow pressure in closed and open circulatory system; Composition and functions of blood & lymph; Mechanism of coagulation of blood, coagulation factors; anticoagulants, haempoiesis

UNIT-II
Respiration: Exchange of respiratory gases, transport of gases, lung air volumes, oxygen dissociation curve of hemoglobin, Bohr's effect, Haburger's phenomenon (Chloride shift), control / regulation of respiration.
Excretion: Patterns of excretory products viz. Amonotelic, ureotlic uricotelic, ornithine cycle (Kreb's– Henseleit cycle) for urea formation in liver.

UNIT-III
Excretion: Urine formation, counter-current mechanism of urine concentration, osmoregulation, micturition.
Neural Integration: Nature, origin and propagation of nerve impulse along with medullated & non-medullated nerve fibre, conduction of nerve impulse across synapse.

UNIT-IV
Chemical integration of Endocrinology: Structure and mechanism of hormone action; physiology of hypothalamus, pituitary, thyroid, parathyroid, adrenal, pancreas and gonads.
Reproduction: Spermatogenesis, Capacitation of spermatozoa, ovulation, formation of corpus luteum, oestrous-anoestrous cycle, Menstrual cycle in human; fertilization, implantation and gestation.

PRACTICAL (P-401)

Max. Marks: 50   **Time allowed: 3Hrs**

1. Classification up to orders, habit, habitats, external characters and economic importance (if any) of the following animals:-

Amphibia   : *Necturus, Proteus, Amphiuma, Salamandra, Amblystoma, Axolotie   larva, Alytes, Bufo, Rana.*

Reptilia   : *Hemidactylus, Calotes, Draco, Varanus, Phrynosoma, Chamaeleon, Typhops, Python, Eryx, Ptyas, Bungarus, Naja, Hydrus, Viper,   Crocodilus, Gavialis, Chelone* (Turtle) and *Testudo* (Tortoise).

Aves   : *Casuarius, Arden, Anas, Milvus, Pavo, Eudynamis, Tyto* and *Alcedo, Halcyon*

Mammalia   : *Ornithorphynchus, Echidna, Didelphis, Macropus, Loris, Macaque, Hystrix, Funambulus, Telix, Panthera, Canis, Herpestes, Capra, Pteropus*

2. Preparation of models of the different systems of the following animals:

Hemidactylus   :   Digestive, arterial, venous and urinogenital systems.

Rat   :   Digestive, arterial, venous and urinogenital systems.

3. Study of the skeleton of *Rana* (Frog), *Varanus,* Pigeon or Gallus and *Orcyctolagus/*rat

4. Study of the following prepared slides: Histology of rat (compound tissues).

5. Study and collection of Quill, Contour, Filoplume and Down feathers

PHYSIOLOGY PRACTICALS:
1.   Estimation of abnormal constituents of urine (Albumin, sugar, ketone bodies).
2.   Use of respirometer.
3.   Haematein crystal preparation.
4.   Estimation of Hb.
5.   DLC of Man/RBC count/WBC count.

Project Report:
  1. Survey of diversity
  2. Parental care
  3. Dentition in mammals
  4. Migration in birds

B.Sc. PART- II (Zoology Practical)

(Semester 3 & 4)

Guidelines/Instructions for Practical Examination

P-301 and P-401

Max Marks: 50+50   **Time allowed: 3+3 Hrs**

Note: Following exercises will be set in the examination as per marks assigned

S. No.	Exercise	Max Marks P-301	Max Marks P-401
1.	Model Preparation	5	5
2.	Temporary mounting –one (Staining, identification, sketch)	2	Not applicable
3.	Museum specimens - four (identification and classification)	6	6
4.	Ecological note –one specimen	2	2
5.	Permanent slides - two (Identification with reasons)	3	3
6.	Bone – identification & sketch	4	4
7.	Physiology (two exercise)	5	5
8.	Zoological excursion and its report	6	
9.	Collection and a brief note on feathers		4+4
10.	Practical record and slides	5	5
11.	Viva	4	4
12.	Project report	8	8

PAPER 5.1
FISH AND FISHERIES

Max Marks: 40+10 (Internal Assessment)   **Time allotted: 3 Hours**
Note: Nine questions are to be set in all and the candidates are required to attempt five questions including the compulsory question

1.   Question 1 is compulsory consisting of 10 parts (1.0 marks each) covering the entire syllabus. Answer to each part should not exceed 20 words.

2.   Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidates are required to attempt four questions, selecting one from each unit.

Unit I
1.   **Introduction to world fisheries:**   Production, utilization and demand.
2   **Fresh Water fishes of India:** River system, reservoir, pond, tank fisheries; captive and culture fisheries, cold water fisheries.

Unit II
3   Fishing crafts and gears.
4.   Fin fishes, Crustaceans, Molluscs and their culture.

Unit III
Seed production: Natural seed resources – its assessment, collection, Hatchery production.
2   **Nutrition:**   Sources of food (Natural, Artificial) and feed composition (Calorie and Chemical ingredients).

Unit IV
3   **Field Culture:** Ponds-running water, recycled water, cage, culture; poly culture.
4.   **Culture technology:**   Biotechnology, gene manipulation and cryopreservation of gametes.

PAPER – 5.2
ECOLOGY & EVOLUTION

Max Marks: 40+10 (Internal Assessment)   **Time allotted: 3 Hours**
Note: Nine questions are to be set in all and the candidates are required to attempt five questions including the compulsory question

3.   Question 1 is compulsory consisting of 10 parts (1.0 marks each) covering the entire syllabus. Answer to each part should not exceed 20 words.
4.   Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidates are required to attempt four questions, selecting one from each unit.

Unit I
1.   **Basic concepts of ecology:**   Definition, significance. Concepts of habitat and ecological niche.
2   **Factors affecting environment:** Abiotic factors (light-intensity, quality and duration), temperature, humidity, topography; edaphic factors; biotic factors.

Unit II
1.   **Ecosystem:** Concept, components, properties and functions; Ecological energetics and energy flow-food chain, food web, trophic structure; ecological pyramids concept of productivity.
2.   **Biogeochemical cycles:** Concept, reservoir pool, gaseous cycles and sedimentary cycles.
3.   **Population:** Growth and regulation.

Unit III
Origin of life.
1.   Concept and evidences of organic evolution.
2.   Theories of organic evolution.
3.   Concept of microevolution and concept of species

Unit IV
1.   Concept of macro-and mega-evolution.
2.   Phylogeny of horse.
3.   Evolution of man.

PRACTICAL (P-501)

Max. Marks:50   **Time allowed: 3Hrs**

1. Identification of *Catle, Labeo rohita, L. calbasu, Cirrhius, mrigala Puntius sarana, Channa punctatus, C. marulius. C. stariatus, Trichogaster fasciata, Mystus seenghala, M. cavasius, M. tengra, Callichrous pabola, C. bimaculatus, Wallago attu, Prawns, Crabs, Lobsters, Calms, Mussels & Oysters.*

2. Chemical analysis of pond water and soil for pH, dissolved oxygen, free CO_2 nitrates, phosphates and chlorides.

3. A study of the slides of fish parasites.

4. A study of the different types of nets, e.g., cast net, gill net, drift net and drags net.

5. A visit to lake/reservoir/fish breeding centre.

6. Evolutionary evidences and/or its demonstration through models/video/CD etc and
    preparation of working models of the different systems of the following animals:
        - Adaptive modifications in feet and beaks of birds
        - Evolutionary evidences of man and horse.
7. Project report :
        i) Pearl culture
        ii) Prawn culture

SYLLABUS (B.Sc.- ZOOLOGY)
w.e.f. Session 2016-17
B. Sc. SEMESTER - VI

PAPER 6.1
ENTOMOLOGY

Max Marks: 40+10 (Internal Assessment)   **Time allotted: 3 Hours**

Note: Nine questions are to be set in all and the candidates are required to attempt five questions including the compulsory question

1.   Question 1 is compulsory consisting of 10 parts (1.0 marks each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2.   Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidates are required to attempt four questions, selecting one from each unit.

Unit I

Study of important insect pests of crops and vegetables:

1   **Sugarcane:**
   (a)   Sugarcane leaf-hopper (*Pyrilla perpusilla*)
   (b)   Sugarcane Whitefly (*Aleurolobus barodensis*)
   (c)   Sugarcane top borer (*Sciropophaga nivella*)
   (d)   Sugarcane root borer (*Emmalocera depresella*)
   (e)   Gurdaspur borer *(Bissetia steniellus)*

With their systematic position, habits and nature of damage caused. Life cycle and control of *Pyrilla perpusilla* only.

2   **Cotton:**
   (a)   Pink bollworm *(Pestinophora gossypfolla)*
   (b)   Red cotton bug *(Dysdercus Cingulatus)*
   (c)   Cotton grey weevil *(Myllocerus undecimpustulatus)*
   (d)   Cotton Jassid *(Amrasca devastans)*

With their systematic position, habits and nature of damage caused. Life cycle and control of *Pectinophore gossypiella.*

Unit II

3   **Wheat:**
            Wheat stem borer (*Sesamia inferens*) with its systematics position, habits, nature of damage caused. Life cycle and control.

4   **Paddy:**
   (a)   Gundhi bug *(Leptocorisa acuta)*
   (b)   Rice grasshopper *(Hieroglyphus banian)*
   (c)   Rice stem borer *(Scirpophaga incertullus)*
   (d)   Rice Hispa *(Diceladispa armigera)*

With their systematic position, habits and nature of damage caused. Life cycle and control of *Loptocorisa acuta.*

Unit III

5   **Vegetables**
   (a)   *Raphidopalpa faveicollis* – The Red pumpkin beetle.
   (b)   *Dacus cucurbitas* – The pumpkin fruit fly.
   (c)   *Tetranychus tecarius* – The vegetable mite.
   (d)   *Epilachna* – The Hadda beetle.

Their systematics position, habits and nature of damage caused. Life cycle and control of *Aulacophora faveicollis.*

6   **Stored grains:**
   (a)   Pulse beetle (*Callosobruchus maculatus*)

       (b)   Rice weevil (*Sitophilus oryzae)*

       (c)   Wheat weevil (*Trogoderma granarium)*

       (d)   Rust Red Flour beetles (*Tribolium castaneum)*

       (e)   Lesser grain borer *(Rhizopertha dominica)*

       (f)   Grain & Flour moth *(Sitotroga cerealella)*

Their systematic position, habits and nature of damage caused. Life cycle and control of *Trogoderma granarium.*

Unit IV

6.   **Insect control:** Biological control, its history, requirement and precautions and feasibility of biological agents for control.

7.   **Chemical control:**   History, Categories of pesticides. Important pesticides from each category to pests against which they can be used. Insect repellants and attractants.

8.   Integrated pest management.

9.   Important bird and rodent pests of agriculture & their management.

PAPER 6.2
DEVELOPMENTAL BIOLOGY

Max Marks: 40+10 (Internal Assessment)   **Time allotted: 3 Hours**

Note : Nine questions are to be set in all and the candidates are required to attempt five questions including the compulsory question

1.   Question 1 is compulsory consisting of 10 parts (1.0 marks each) covering the entire syllabus. Answer to each part should not exceed 20 words.
2.   Out of remaining eight questions, two questions are to be set from each unit (I to IV), possibly splitting them in parts. Candidates are required to attempt four questions, selecting one from each unit.

Unit I

1.   Historical perspectives, aims and scope of developmental biology.
2.   Generalized structure of mammalian ovum & sperm. Spermatogenesis and Oogenesis.

Unit II

1.   Fertilization, parthenogenesis, different types of eggs and patterns of cleavage in invertebrates and vertebrates.
2.   Process of blastulation in invertebrates and vertebrates
3.   Fate-map construction in frog and chick.

Unit III

1.   Gastrulation in invertebrates and vertebrates
2.   Gastrulation & formation of three germinal layers in frog and chick.
2.   Elementary knowledge of primary organizers.

Unit IV

1.   Extra embryonic membranes: structure & significance in birds and mammals.
2.   Concepts of competence, determination and differentiation.
3.   Concept of regeneration.

PRACTICAL (P-601)

Max. Marks:50   **Time allowed: 3Hrs**

1. External morphology, identification marks, nature of damage and host of the following pests:
    i. **Sugarcane:** Sugarcane leaf-hopper, Sugarcane whitefly, Sugarcane top borer, Sugarcane root borer, Gurdaspur borer (any two).
    ii. **Cotton :**   Red Cotton bug
    iii. **Wheat:**   Wheat stem borer
    iv. **Paddy:**   Gundhi bug, Rice grasshopper, Rice stem borer, Rice hispa (any one).
    v. **Vegetables:** *Aulocophora faveicollis, Dacus cucurbitas, Tetranychus tecarious, Epilachna* (any three).
    vi. **Pests of stored grains:** Pulse beetle, Rice weevil, Grain & Flour moth, Rust-red flour beetle, lessergrain borer (any three).

2. Preparation of permanent/temporary slides of developmental stages of frog/mosquito

3. Study of permanent slides of WM of chick embryo (13-18h, 24-36h, 36-48h, 48-72h).

4. Window preparation and identification of stages of development in chick egg.

5. Project report:
    1. Apiculture
    2. Sericulture

B.Sc. PART- III
Semester V & VI
Guidelines/Instructions for Practical Examination
P-501 and P-601

Max Marks: 50+50   **Time allowed: 3+3 Hrs**

SNo	Title of experiment	MM P-501	MM P-601
1.	Chemical analysis of water/soil	5	-
2.	Identification and Classification of specimens (Four)	8	-
3.	Ecological note on economically important specimen (two+two)	6	6
4.	Evolutionary evidences	3	-
5.	Slides/nets etc	3	-
6.	Field report	8	-
7.	Identification and Classification of specimens (Four)	-	8
8.	Comment on the Life cycle of a given pest	-	5
9.	Identification of embryological slides with reasons of identification (Two)	-	6
10.	Preparation of window in the egg	-	4
11.	Preparation of the permanent/temporary slides of the various development stages of frog/mosquito.	-	4
12.	Project report	7	7
13.	Practical note book	5	5
14.	Viva-voce	5	5

Note: Field report/collection to be submitted during exam

विषय-सूची

पाठ्यक्रम

महर्षि दयानन्द विश्वविद्यालय, रोहतक

बी.एससी. द्वितीय वर्ष (हिन्दी)
हिन्दी (अनिवार्य) तृतीय सेमेस्टर

पूर्णांक : 40

समय : 3 घण्टे

पाठ्य विषय

1. **आठ अर्वाचीन कवि** : संपा. डॉ. लालचंद गुप्त 'मंगल' एवं मदन गुलाटी, कुरूक्षेत्र विश्वविद्यालय प्रकाशन

   निर्देश : सप्रसंग व्याख्यार्थ दिए गए चार अंशों में से दो की व्याख्या करनी होगी। पूछे गए दो कवियों में से एक कवि का साहित्यिक परिचय लिखना होगा। व्याख्या के लिए बारह तथा कवि परिचय के लिए छः अंक निर्धारित हैं।

2. **निबंध लेखन**

   निर्धारित निबंध : 1 मानवाधिकार 2 नैतिक शिक्षा 3 मद्य निषेध 4 विज्ञान और औद्योगीकरण 5 वैज्ञानिक पद्धति में भारत का योगदान 6 वैश्वीकरण और विज्ञान 7 दूरदर्शन 8 समाचार पत्र

   निर्देश : पाठ्यक्रम में निर्धारित आठ विषयों में से कोई चार विषय पूछे जाएंगे जिनमें से किसी एक पर निबंध लिखना होगा। इसके लिए आठ अंक निर्धारित हैं।

3. **पत्र-लेखन : सरकारी पत्र**

   निर्देश : पूछे गए किन्हीं दो सरकारी पत्रों में से परीक्षार्थी को एक पत्र लिखना होगा। इसके लिए नौ अंक निर्धारित हैं।

4. **वैज्ञानिक शब्दावली**

   निर्धारित शब्दावली

1. Aeronatics	2. Afforestation	3. Alloy	4. Amplifire
5. Analysis	6. Antibodies	7. Atmosphere	8. Bicomex Lens
9. Calculating Machine	10. Calibration	11. Calination	12. Capillary
13. Catalyst	14. Caustic Alkli	15. Central axis	16. Cerebelbem
17. Chromosomes	18. Cluster	19. Coefficient	20. Compound
21. Condensation	22. Convection	23. Convex	24. Comet
25. Decomposition	26. Deflection	27. Dehydration	28. Diffusion
29. Distillation	30. Ecology	31. Elasticity	32. Electro osmories
33. Equilibrium	34. Equivalent	35. Endothermic	36. Extraction
37. Fermentation	38. Fertilization	39. Freezing	40. Fission
41. Formula	42. Fossel	43. Friction	44. Galvanometer
45. Germicide	46. Gland	47. Graft	48. Heater
49. Homologous	50. Hybrid		

   निर्देश : पाठ्यक्रम में निर्धारित 50 अंग्रेजी शब्दों में से 15 शब्द पूछे जाएंगे जिनमें से परीक्षार्थी को किन्हीं दस शब्दों के हिंदी-तकनीकी-अर्थ लिखने होंगे। इसके लिए दस अंक निर्धारित हैं।

TIME TABLE OF B.A.
w.e.f. 06-01-2020 Session 2019-20

Even Semester ①

Period / Class	9:00 to 9:45 I	9:45 to 10:30 II	10:30 to 11:15 III	11:15 to 12:00 IV	12:00 TO 12:45 V	12:45 TO 1:30 VI	1:30 TO 2:15 VII	2:15 TO 3:00 VIII	3:00 TO 3:45 IX
B.A. 1	Math History Sec-A R.N-102 T-V.S. Sec-B R.N-103 T-A.S.	English Sec-A+B R.N-102 T-DR. NEELAM Sec-C+D+E R.N-103 T-	Math Eco R.N-103 T-DR. KAMLA Pol. Sci. Sec-A R.N-101 T-AMIT KUMAR Pol. Sci. Sec-B R.N-102 T-	Geog. Practical	History Sec-C R.N-102 T-A.S.	Evs (1-4) R.N-102 T-	Comp. (5-6) R.N-101 T-	Pol. Sci. Sec-C T-AMIT KUMAR R.N-101 Sec-D	Hindi Sec-A R.N-101 T-DR.PAVITA Sec-B R.N-102 T-DR. SUNITA Sec-C R.N-103 T-DR. REKHA	Maths Geog. Sec-A R.N-102 T-HARIOM Sec-B R.N-103 T-SANJAY Hindi Sec-D R.N-104 T-DR. REKHA Sec-E R.N-204 T-DR. SUNITA	Evs – (5-6) R.N. – 102 Comp. R.N-103 (1-4)
B.A. 2ND	Geog. Practical			Math Eco R.N-103 T-DR. KAMLA Geog. Sec-A R.N-104 T-RAKESH Hindi Sec-D R.N-204 T-	Hindi Sec-A R.N-201 T-DR. REKHA Sec-B R.N-202 T-DR. PAVITA Sec-C R.N-203 T-DR. SUNITA ENGLISH Sec-D R.N-103 T-DR. NEELAM	Math History Sec-A R.N-102 T-V.S. Sec-B R.N-103 T-A.S. Geog. Sec-B R.N-104 T-RAHUL	Pol. Sci. Sec-A R.N-201 T-AMIT KUMAR Sec-B R.N-202 T- Sec-C R.N-203 T- History Sec-C R.N-204 T-V.S.	English Sec-A R.N-201 T-DR. NEELAM Sec-B R.N-202 T- Sec-C R.N-203 T-	Math
B.A. 3RD	English Sec-C R.N.-202 T-	Math History Sec-A R.N-201 T-V.S. Sec-B R.N-202 T-A.S.	Math English Sec-A R.N-201 T-DR. NEELAM Sec-B R.N-202 T-	Pol.Sci. Sec-A R.N-201 T- Sec-B R.N-202 T-AMIT KUMAR Sec-C R.N-203 T-	Math Eco R.N-201 T-DR. KAMLA Geog. R.N-201 T-PARDEEP	Hindi Sec-A R.N-201 T-DR.SUNITA Sec-B R.N-202 T-DR. REKHA Sec-C R.N-203 T-DR. PAVITA	Geog. Practical		

Principal
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Satnali (M.garh)

Govt. College, Satnali
(M.garh)

B.Com-I, II, III

GOVERNMENT COLLEGE SATNALI
TIME TABLE DEPARTMENT OF COMMERCE
w.e.f. 06-01-2020 Session 2019-20

Even Semester ②

Period— Class	9:00 to 9:45 1	9:45 to 10:30 11	10:30 to 11:15 111	11:15 to 12:00 1V	12:00 TO 12:45 V	12:45 TO 1:30 V1	1:30 TO 2:15 V11	2:15 TO 3:00 V111
B.COM 2nd SEM	Financial A/C-II 1-6 Sh. Birender Shekhawat	BUSS. Mgt-II 1-6 Dr. Neetu	Buss. Economics-II 1-6 Kamala	Buss. Math-II 1-6 Dr. Ashish	Business Environment 1-6 Shweta	Basics of Computer-II 1-6		
B.COM. 4th SEM	Corporate A/C-II Shweta	Business Statistics-II Sh. Birender Shekhawat	B.R.F.W.-II Neetu	Marketing Mgt. Shweta 1-3	Corporate Law-II Neetu	Banking And Banking Law Dr.Kamala Devi		
B.COM 6th SEM	Financial Mgt. Neetu	Cost A/C -II Shweta	International Marketing Shaelig 4-6	Income Tax Law-II Sh. Birender Shekhawat	Auditing 1-6 Birender Singh Shekhawat	GST 1-2 Dr.Neetu 3-4 Smt Shweta 5-6 Sh. Birender Singh Shekhawat		

Head Department of Commerce Neetu

Principal
Govt. College
Satnali (M.garh)

Principal
Govt. College. Satnali
(M/Garh)

B.Sc. I, II, III

GOVERNMENT COLLEGE SATNALI (M/GARH)
B.Sc. Time Table Session 2019-20 w.e.f. 06/01/2020

Even Semester

③

Periods	I	II	III	IV	V	VI	VII	VIII	IX
Classes	9.00-9.45	9.45-10.30	10.30-11.15	11.15-12.00	12.00-12.45	12.45-1.30	1.30-2.15	2.15-3.00	3.00-3.45
B.Sc.-I	Math R.N.-206 T.-Dr.Ashish Sec.-B R.N.-207 T.-Dr.Ritu	Physics Sec. A R.N.-207 T.- Ravi Sec.-B R.N.-301 T.- Zoology R.N.-206 T.- Dr. Sandeep	Math Sec. A R.N.-207 T.- Sec.-B R.N.-301 T.- Botany R.N.-206 T.- Dr. Sadhana	Practical		EVS Sec-A (1-2) R.N.-206	EVS Sec-B (3-4) R.N.-207	Chemistry Section- A R.N.-206 T.- Yogita(1-2) Dr. S.B. (5-6) Vipin (3-4) Sec.-B R.N.-207 T.- Yogita(3-4) Dr. S.B. (1-2) Vipin (5-6	Math Section- A R.N.-207 T.- Sec.-B R.N.-206 T.-A.Malik	English R.N.-207 (1-4) T.- Comp. awareness R.N.-206 (5-6) T.-Kavita
B.Sc. -II	Practical			Math Sec. A R.N.-302 T.-Dr.Ashish Sec.-B R.N.-301 T.-A.Malik	Chemistry Section- A R.N.-301 T.- Yogita(1-2) Dr. S.B. (5-6) Vipin (3-4) Sec.-B R.N.-302 T.- Yogita(3-4) Dr. S.B. (1-2) Vipin (5-6)	Math Section- A R.N.-301 T.-Dr.Ritu Sec.-B R.N.-302 T.-Dr.Ashish	Physics Sec. A R.N.-301 T.-Ravi Sec.-B R.N.-302 T.-Pooja	Hindi Sec.-A R.N.-301 T.-Dr.Pavita (1-3) Sec.-B R.N.-301 T.-Dr.Pavita (4-6)	Math Sec. A R.N.-207 T.-A.Malik Sec.-B R.N.-301 T.-
B.Sc. – III	Chemistry R.N.-205 T.-Yogita(1-2) Dr. S.B.(3-4) Vipin (5-6)	Math R.N.-205 T.-Dr.Ritu	Math R.N.-205 T.-Dr.Ashish	Physics R.N.-205 T.-Pooja	Math R.N.-205 T.-A.Malik		Practical		

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GOVERNMENT COLLEGE SATNALI
TIME TABLE OF B.A.
w.e.f. 16-11-2020 Session 2020-21

Period / Class	9:00 – 9:30 I	9:31 – 10:00 II	10:01 – 10:31 III	10:31 – 11:00 IV	11:31 – 12:00 V	12:31 – 12:00 VI
B.A. 1st Monday Tuesday	Hindi Sec-A,B,C R.N.-202,203,204 A-Sr. Pavita B-Sr. Rekha C-Sr. Sunita English Sec-D,E R.N.-201,202 D-Sr. Neelam E-Sr. T-5	English Sec-A,B,C R.N.- 202,203,204 A-Sr. Neelam B- T-5 C- T-5 Hindi Sec-D,E R.N.- 201,202 D-Sr. Rekha E-Sr. Sunita	History Sec-A,B,C R.N.- 202,203,204 A-Ajit Singh B-'V' C-V	Eco Sec-A R.N.-202 A-Dr. Kamla Math Sec-A R.N.-203 Comp. Awareness Smt. Kavita Bai R.N.-205 Sec-B	Geography Sec-A,B R.N.- 202,203 A-PAROM B-SANJAY Comp. Awareness Smt. Kavita Bai R.N.-205 Sec-C	Pol. Science Sec-A,B,C R.N.-201,202,203 A-Sr. Amit B-V C-V Comp. Awareness Smt. Kavita Bai R.N.-205 Sec-D
B.A. 2nd Wednesday Thursday	Hindi Sec-D R.N.-201 English Sec-A,B,C R.N.-202,203,204 A-T-5 B-T-3 C-T4	Sec-D- Neelam R.N.-201 Hindi Sec-A,B,C R.N.- 201,202,203 A-Sr. Rekha B-Sr. Pavita C-Sr. Sunita	History Sec-A,B,C R.N.- 202,203,204 A-Ajit Singh B-V C-V	Eco Sec-A R.N.-202 A-Dr. Kamla Math Sec-A R.N.-203	Geography Sec-A,B R.N.- 201,202 A-RAKESH B-RAHUL	Pol. Science Sec-A,B,C R.N.-201,202,203 A-Sr. Amit B-V C-V
B.A. 3rd Friday Saturday	Hindi Sec-A,B,C R.N.-202,203,204 A-Sr. Sunita B-Sr. Rekha C-Sr. Pavita	English Sec-A,B,C R.N.- 201,202,203 A-T-5 B-T-5 C-V	History Sec-A,B,C R.N.-202,203,204 A-Ajit Singh B-V C-V	Eco Sec-A R.N.-202 A-Dr. Kamla Math Sec-A R.N.-203 Geography Sec-A R.N.-202 A-PARDEEP	Geography Sec-B R.N.-202 B-PARDEEP	Pol. Science Sec-A,B,C R.N.-201,202,203 A-Sr. Amit B-V C-V

Convener
Time Table Committee

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TIME TABLE OF B.Sc.
w.e.f. 16-11-2020 Session 2020-21

Period Class	12:00 to 12:45 IV	12:45 to 01:30 IV	01:30 to 02:15 IV	02:15 to 03:00 IV	03:00 to 03:30 V
B.Sc 1ST Monday Tuesday	Chemistry R.N.-206 SEC-A(NM)- PINKI SEC-B(NM)-VIPIN (M)- SHRI BHAGWAN SEC-A(NM)- SHRI BHAGWAN SEC-B(NM)- PINKI (M)- VIPIN	Math R.N.-207 SEC. A-ASHISH, B- RITU SEC. B-ASHISH,A-AMIT Botany R.N.-206 SADHANA	Physics R.N.-207 SEC. A(207)DEVENDER SEC. B (205) RAVI SHANKAR Zoology R.N.- 206	English R.N.-206 12:00 ENGLISH JARNAIL SINGH	Computer Awareness R.N.- 206 KAVITA BAI SEC-A SEC-B
B.Sc 2ND Wednesday Thursday	Math R.N.-207 SEC-A- ASHISH, B- AMIT SEC-A-AMIT , B- RITU Botany R.N.-206 SADHANA	Physics R.N.-207 SEC. A (207) DINESH SEC. B (205) POOJA Zoology R.N.- 206	Chemistry R.N.-206 SEC-A(NM)- VIPIN SEC-B(NM)- SHRI BHAGWAN (M)- PINKI SEC-A(NM)- PINKI SEC-B(NM)- VIPIN (M)- SHRI BHAGWAN	Hindi SEC-A (NM) 1-3 R.N.-206 SEC-B(NM&M)4-6 DR.PAVITA	-----
B.Sc 3RD Friday Saturday	Physics R.N.-207 SEC. A (205) DEVENDER SEC. B (207) DINESH	Chemistry R.N.-206 SEC-A(NM)- SHRI BHAGWAN SEC-B(NM)- PINKI SEC-A(NM)- VIPIN SEC-B(NM)- SHRI BHAGWAN	Math R.N.-207 SEC. A-AMIT, B- ASHISH SEC. A- ASHISH, B- RITU	-----	-----

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