GOVERNMENT COLLEGE SATNALI, MAHENDERGARH

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

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Metric 2.5.1: Mechanism of internal assessment is transparent and robust in terms of frequency and mode

The college affiliated to I.G. University, Meerpur (Rewari), strictly adheres to the guidelines of the University for conducting continuous Internal Evaluation. An academic calendar clearly specifying the date and time of various academic events to take place, is notified before the commencement of the academic session. For assessment and evaluation, the pattern is as follows in both U.G. classes are as follows:

Assessment/Evaluation

Internal Marks	Major Test	Total Marks
20	80	100

Internal Evaluation

Minor Test	Attendance	Assignment	Total
10	05	05	20

Some of the sample of Minor Test and Assignments Process followed by the various departments is submitted as under

1. **CLASS TESTS**
2. **ASSIGNMENTS**

(NAAC In-Charge)

Principal
Principal
Government College Satnali
Govt. College, Satnali
(Mahendergarh)

GOVERNMENT COLLEGE SATNALI

ASSIGNMENT OF BOTANY

TOPIC - GENERAL CHARACTERISTICS OF BRYOPHYTES AND COMPARISON B/W MARCHANTIA, ANTHOCEROS, FUNARIA

SESSION - 2019-20

CLASS - B.Sc I (MEDICAL)

ROLL No. - 4705420009

SUBMITTED BY - MAMTA

SUBMITTED TO - MRS. SADHANA YADAV

General Characteristics Of Bryophytes

1. Distribution -

Bryophyta is a group of the simplest and the most primitive, non-vascular land plants and includes about 24000 species in 960 genera.

2. Habitat -

They are terrestrial in habitat and usually grow in moist and shady places but require presence of water to complete their life cycle and therefore regarded as amphibians of plant kingdom. However a few grow under diverse habitat such as aquatic submerged, as epiphytes on tree trunks and branches.

3. Gametophyte -

It is the most conspicuous nutritionally independent phase of plant representing dominant haploid phase in the life cycle. It produces sex organs and concerns with the sexual reproduction.

a) Morphology -

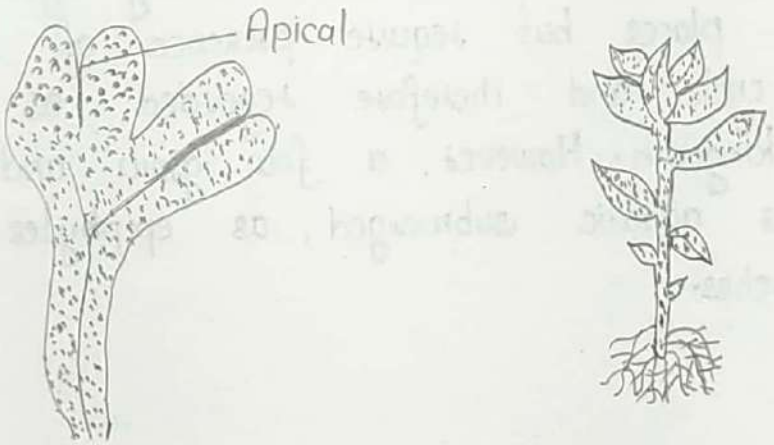
Plant body is either a simple thalloid, growing prostrate on the ground and attached to the latter by delicate unicellular hair like outgrowths called rhizoids eg. Marchantia, Riccia while in others it is like rootless leafy shoots e.g Pasella or erect leafy plants with stem like central axis, leaf like appendages and roots like rhizoids e.g Funaria, Polytrichum.

b) Internal structure-

The vascular tissue i.e xylem or phloem is completely absent. However in few masses like Polytrichum, xylem like hydroides and phloem like leptoids which conduct water and food respectively have been reported.

c) Nutrition-

The plants are green, possess chloroplast and hence are autotrophic in their mode of nutrition. However, a few species are saprophytes and lead a heterotrophic mode of nutrition. e.g. Cryptothallus mirabilis, a liverwort.



Thalloid liverworts Leafy moss

4. Reproduction-

Reproduction by asexual spores (meiospores) is completely absent in Bryophytes.

a) Vegetative Reproduction-

It occurs by fragmentation, adventitious branches, tubers, gemma cups etc.

Sexual reproduction is highly oogamous and sex organs are jacketed.

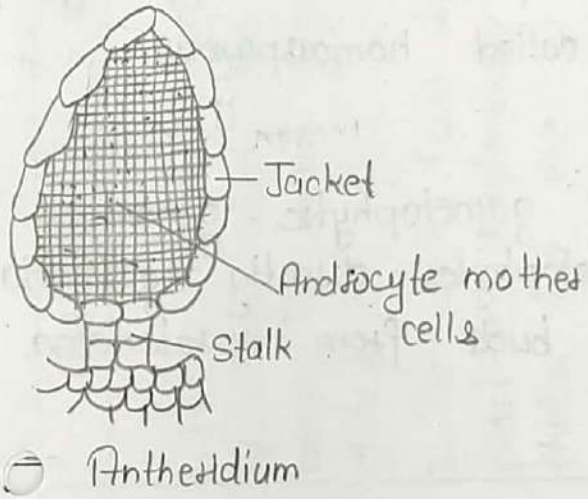
Sex organs -

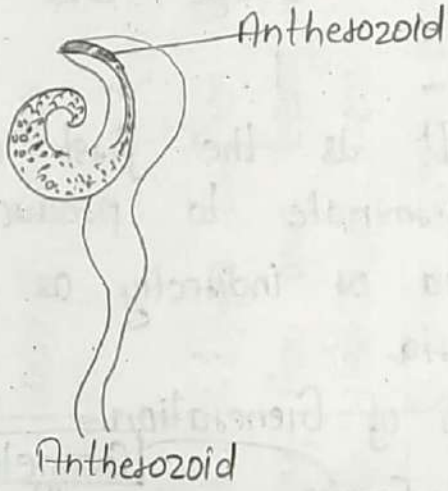
Male reproductive organs are stalked ellipsoidal or club shaped antheridia producing a mass of numerous biflagellate male gametes, the antherozoids.

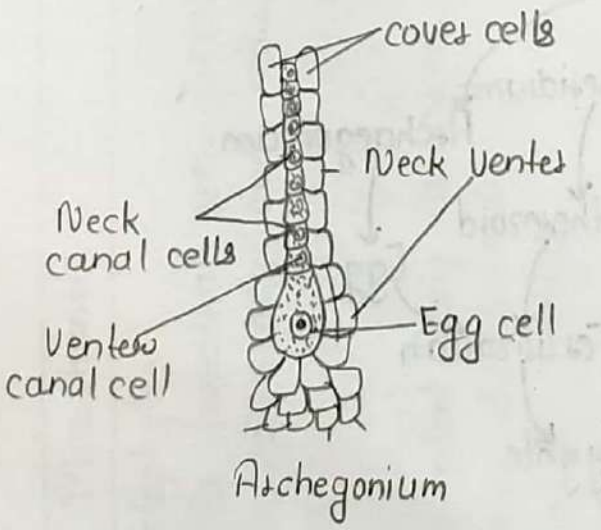
Female sex organs are stalk flask shaped archaegonia consisting of a upper slender elongated neck and lower sac like swollen part, the venter enclosing a large naked non-motile egg.

c) Fertilization -

Water or moisture is essential for the movement of sperms to the archaegonia, where they fertilize the egg to produce zygote (2N).







5. Sporophyte-

Diploid zygote is the pioneer structure of sporophyte phase. It develops into a diploid, nutritionally dependent sporophytic plant body called the sporogonium chiefly concerned with the production of spores.

a) Sporogonium-

The wall of the venter forms calyptra providing protection to the developing sporogonium. Mature sporogonium is differentiated into foot, seta and capsule, however foot and seta are absent in Riccia.

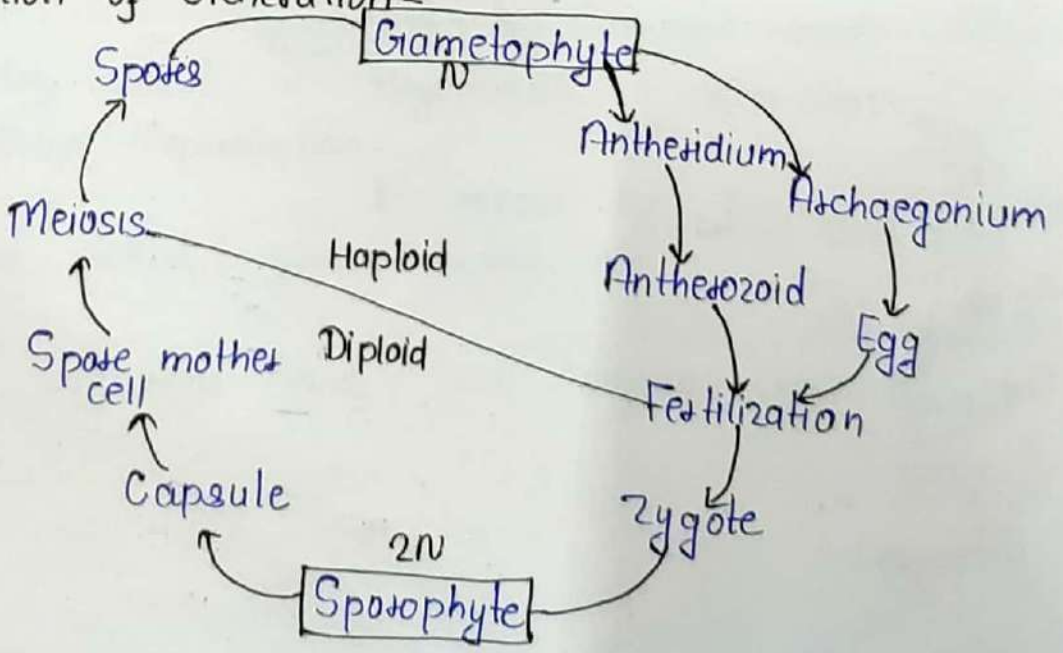
b) Capsule-

Haploid spores are differentiated from the diploid spore mother cells by meiosis. Spores are morphologically similar in shape and size called homosporous.

c) Spore-

It is the first cell of gametophytic generation which germinate to produce gametophyte directly e.g. Riccia, Marchantia or indirectly as lateral buds from protonema e.g. Funaria.

Alternation of Generation-



Compasison b/w Marchantia, Anthoceros and Funaria

Marchantia	Anthoceros	Funaria
Gametophyte -		
1. It is terrestrial and grows in damp shady and moist places.	1. It is terrestrial and grows in damp, shady and moist places. The plant grows in clutes.	1. It prefers to grow the lands burnt by fires and moist, shady places. It grows in dense tuffs.
2. The plant body is green, prostate, dichotomously branched thallus.	2. The plant body is green, prostate, dichotomously branche thallus but due to unequal dichotomy, the thallus become irregular.	2. The plant is leafy, green upright, radial in symmetry. Branching is monopodial.
3. Thallus lobes bear distinct midrib, which ends in a terminal lobe.	3. There is no midrib or a dorsal furrow.	3. Leafy gametophyte is differentiated into erect axis, bearing green flat appendages and rhizoids.
4. Upper surface of thallus is marked by rhomboidal areas, each with a distinct centre pore.	4. Upper surface is smooth they are being no rhomboidal areas.	4. Leaves are sessile, oblong with smooth margin and distinct midrib.
5. No algae are fnt in the thallus.	5. Small, dark blue green spores are seen in the surface view.	5. No algae is fnt.

6. Presence of gemma cups is another distinguishing feature.	6. No gemma cups.	6. No gemma cups.
7. Both rhizoids and scales arise from the ventral surface of thallus, along the midrib region.	7. Only smooth walled rhizoids are present that arise from the ventral surface of stem.	7. Scales are absent rhizoids arising from the base of the stem as there is no dorsiventral symmetry.
8. Rhizoids are unicellular, aseptate and unbranched. These are of two types - smooth walled and tuberculated.	8. Rhizoids are unicellular, aseptate and unbranched. These are only of one type i.e smooth walled.	8. Rhizoids are unicellular, branched and oblique septa and are only of one type.
Anatomy.		
9. Internally the thallus is several layers thick.	9. The thallus is simple and several layers thick in the middle and gradually tapers towards margins.	9. In the leafy shoot axis is several layered thick, appendages are thick in the midrib.
10. Cells are differentiated and arranged in two distinct regions, the upper green photosynthetic regions and lower storage region.	10 Cells show no or little differentiation in the tissue. All are compactly arranged parenchyma cells except the surface layers.	10 Internally mass stem shows certain amount of differentiation The cells are arranged in three distinct regions the epidermis, cortex and central cylinder.

Sex organs -		
11. All species are dioecious strictly.	11. Both monoecious and dioecious species are fnt.	11. Both monoecious and dioecious species occur.
12. Sex organs are borne on special upright terminal branch of thallus called gametophore.	12. Sex organs are embedded in thallus. No special branch are fnt.	12. Sex organs occur in clusters at the tips of branches which are not special in anyway.
13. Sex organs are developed in a line back from the apex in acropetal order.	13. Antheridia occur singly or in groups whereas archegonia occur singly beneath the upper surface of thallus.	13. The antheridia occur at the apex of the main shoot whereas archegonic are borne at the apex of female branch.
14. Sex organs are exogenous in origin.	14. The antheridia are endo genous in origin whereas archegonia are exogenous.	14. Both are exogenous in origin.
15. Antheridium is an ovoid body supported on a multi-cellular and short stalk.	15. Antheridium is a club shaped orange coloured body raised on a long and multicellular stalk.	15. Antheridium is a club shaped orange coloured body raised on a short and multicellular stalk.
16. Archegonia are flask shape passessing? (i) A short but distinct stalk. (ii) Long neck with greater no. of neck canal cell.	16. In structure archegonium different from bryophytes- (i) It has no stalk. (ii) Embedded in the tissue of thallus.	16. Archegonium is typically flask shaped. (i) Long and stout stalk. (ii) Project over the female branch.

17. Venter consists of a layer of jacket cells.	17. There is no venter wall of sterile cells.	17. Venter wall is two layers in thickness.
Sporophyte-		
18. Capsule is not much elaborated.	1. It is larger and more complex internally than Marchantia.	1. It is far more elaborated both externally and internally.
2. It is differentiated into a foot short seta and capsule	2. It is differentiated into foot an intermediate zone and a capsule. Seta is absent.	2. It is differentiated into foot, a long and slender seta and a capsule.
3. It hangs freely from the under surface of the female receptacle surrounded by the perigynium and the perichaetium.	3. Arises in clusters from the dorsal surface of the thallus each surrounded at the base by a tubular involucre.	3. It is surrounded and the distal end of female branch Protective sheaths are lacking.
4. Capsule is an oval yellow body concerns with both production and dispersal of spores.	4. Capsule is long, slender, cylindrical body of uniform thickness. It is meant for both production and dispersal of spores. Its wall help in photosynthesis.	4. Capsule is a pear shaped body that is far elaborate than any other bryophyte. It is specialized for (i) Basal apophysis for photosynthesis. (ii) Middle theca for spore of production.

5. Archesporium is formed from entire endothecium	5. Archesporium develops from inner layer of endothecium	5. Archesporium develops from the outer layers of the endothecium.
Dehiscence-		
6. Capsule wall splits open into 4-6 irregular structure from apex to the middle, exposing a mass of spores and elaters.	6. Dehiscence is very irregular. Capsule splits along 1-4 lines of dehiscence to form valves.	6. The annulus cells perish and the operculum falls off exposing the peristome teeth.
7. The sporophyte is totally parasitic for its nutrition on the potent gametophyte plant.	7. Sporophyte is a semi-parasite on gametophyte and it is able to form carbohydrate.	7. Sporophyte is semiparasite on the gametophyte for the supply of water and minerals.
8. Sporophyte is short lived structure.	8. Sporophyte is comparatively long lived structure.	8. Sporophyte dies with the complete shedding of spores successive showers.

NAME - MONIKA

CLASS - B.A. Ist

ROLL NO. - 2158620033

GEOGRAPHY

ASSESSMENT

* चट्टान : अर्थ एवं परिभाषा

स्थलमण्डल का निर्माण करने वाले पदार्थों को चट्टान कहते हैं। चट्टान शब्द से सामान्यतः ऐसे पदार्थों का बोध होता है जो शिला जैसे कठोर और दृढ़ हो, परन्तु वैज्ञानिक भाषा में "भू-पृष्ठ का निर्माण करने वाले सभी प्राकृतिक पदार्थ चट्टान कहलाते हैं।

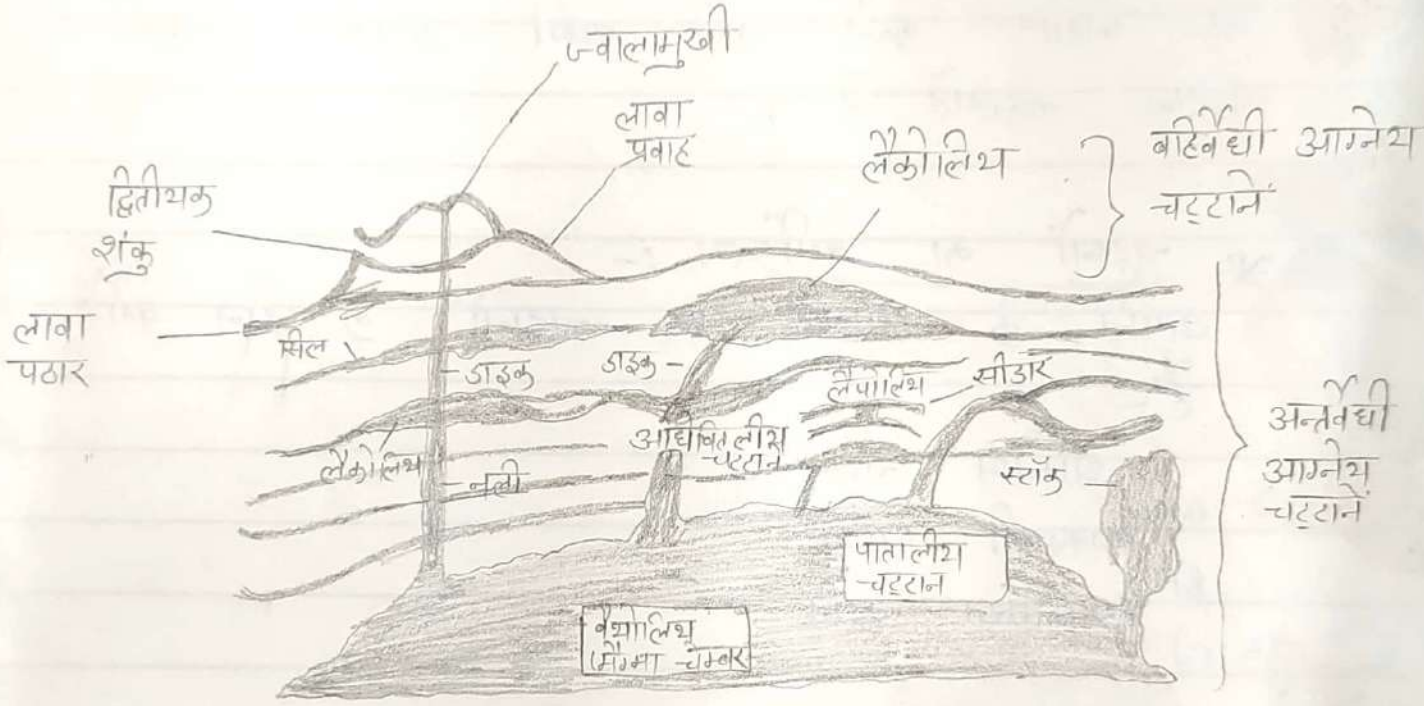
* चट्टानों का वर्गीकरण :-

उत्पत्ति के आधार पर चट्टानों के तीन वर्ग हैं-

A) आग्नेय चट्टानें
B) अवसादी चट्टानें
C) रूपान्तरित चट्टानें

आग्नेय चट्टानें

A. आग्नेय शब्द का अंग्रेजी रूप Igneous लैटिन भाषा के Ignis से लिया गया है, जिसका अर्थ आग्नि होता है। अतः ऐसी चट्टानें जिनका निर्माण पृथ्वी के भीतर उपस्थित तप्त एवं तरल द्रव्य के ठण्डा होकर ठोस हो जाने से हुआ हो, आग्नेय चट्टानें कहलाती हैं। पृथ्वी पर सबसे पहले आग्नेय चट्टानों का निर्माण हुआ था।

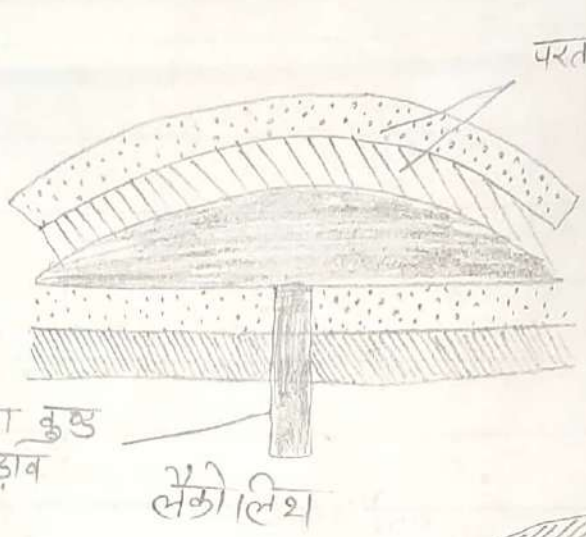


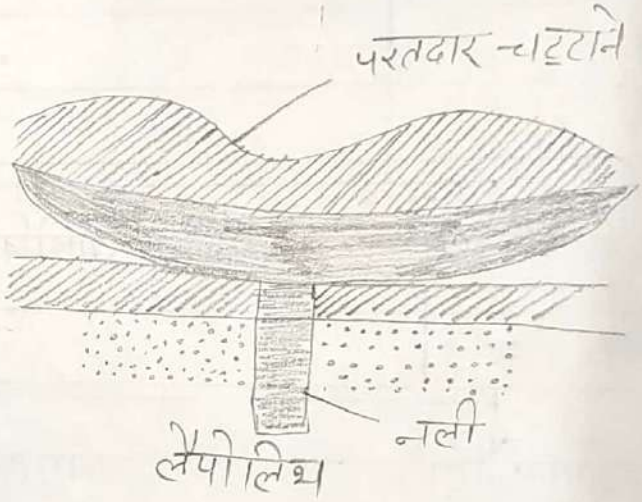
आग्नेय चट्टानें

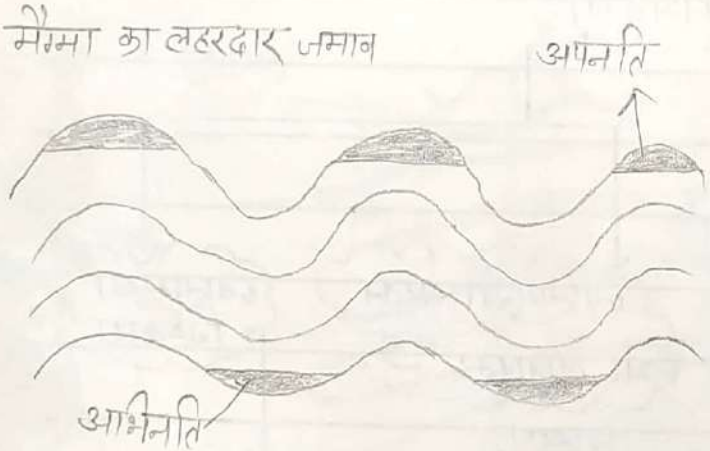
- स्थिति के आधार पर
  - अंतर्वेधी
    - पातालीय
      - बैथोलिथ
        - उदाहरण: ग्रेनाइट, ग्रेनाइट
    - आधिवितलीय
      - सिल, डाइक
      - लैकोलिथ
        - उदाहरण: डोलेराइट
  - बहिर्वेधी
    - ज्वालामुखी चट्टान या लावास्तर
      - उदाहरण: बेसाल्ट, आब्सीडियन
    - ज्वालामुखी निष्कास
      - राख, सिंडर, ज्वालामुखी बम
        - उदाहरण: झांवा पत्थर
- रासायनिक संरचना के आधार पर
  - अधिसिलिक
    - उदाहरण: ग्रेनाइट, आब्सीडियन
  - अल्पसिलिक
    - उदाहरण: बेसाल्ट ग्रेवो

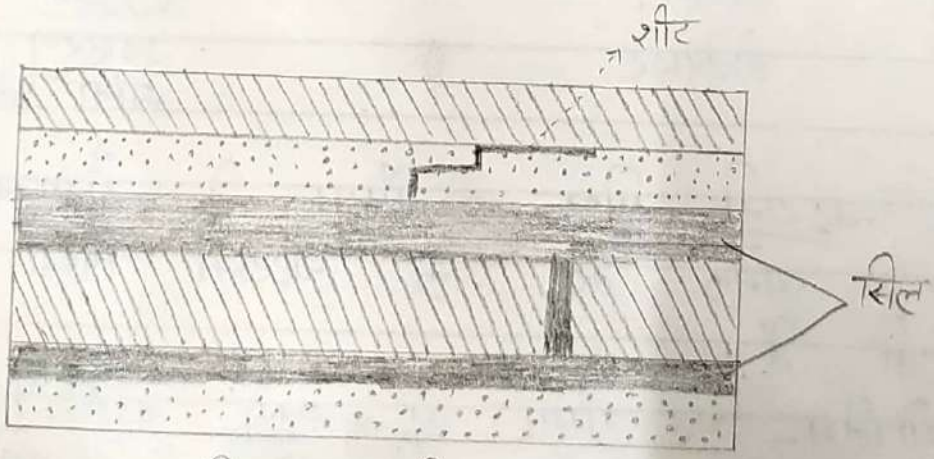
* आग्नेय चट्टानी पिण्ड – मैग्मा के ठोसावस्था में आने पर अनेक तरह के चट्टानी पिण्डों की रचना होती है।

i) बैथोलिथ – यह मैग्मा का सबसे बड़ा गुम्बदाकार जमाव है जो अत्यधिक गहराई में पाया जाता है। अनाच्छादन के बाद इसका केवल ऊपरी भाग ही देखा जा सकता है।









सिल या शीट

ii) स्टॉक – छोटे आकार के बैथोलिथ को स्टॉक कहते हैं। स्टॉक की ऊपरी सतह का विस्तार 100 वर्ग किमी. से कम क्षेत्र में होता है।

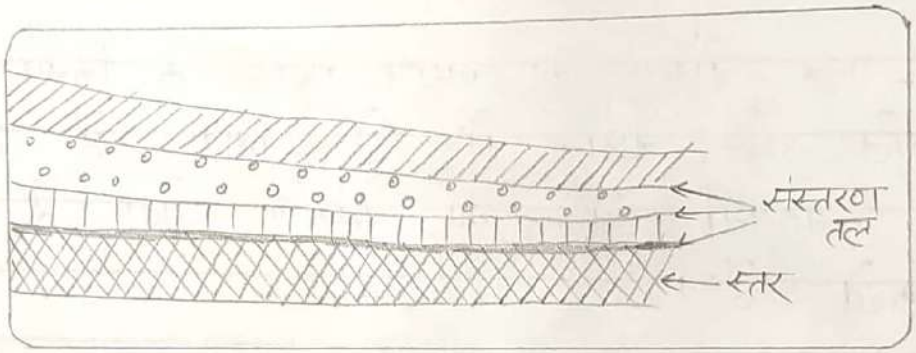
iii) लैकोलिथ – लैकोलिथ की निचली परत सीधी होती है जो नली के द्वारा मैग्मा भण्डार से जुड़ी होती है। लैकोलिथ बर्हिवेधी ज्वालामुखी पर्वत का अन्तर्वेधी प्रतिरूप है।

iv) लैपोलिथ – जब मैग्मा का जमाव धरातल के किसी अवतल आकार वाले उथले बेसिन में हो जाता है तब एक तश्तरीनुमा चट्टानी पिण्ड का निर्माण होता है, जिसे लैपोलिथ कहते हैं।

v) फैकोलिथ – मोड़दार पर्वतों की अपनति व अभिनति में मैग्मा के जमाव को फैकोलिथ कहते हैं। यह लहरदार आकृति का होता है।

vi) सिल – परतदार चट्टानों के बीच भू-पृष्ठ के समानान्तर मैग्मा से बनी अधिवितलीय चट्टान को सिल कहते हैं।

vii) डाइक – जब भू-तल के नीचे मैग्मा लम्बवत् जोड़ों या दरारों में जमता है तो डाइक कहलाता है। आस-पास की चट्टानों के अपरदन द्वारा नष्ट होने पर डाइक एक खड़ी या सूधी विशाल दीवार की भाँति दिखाई पड़ते हैं।



संस्तरण तल और शैल स्तर

* आग्नेय चट्टानों की विशेषताएँ –

i) आग्नेय चट्टानें कठोर, ठोस व संहत होती हैं, इसलिए ये टिकाऊ भी होती हैं।

ii) इन चट्टानों में परतें नहीं होतीं, बल्कि ये स्थूल होती हैं।

iii) इन चट्टानों में रन्ध्र, नहीं होते, अतः जल इनमें प्रवेश नहीं कर पाता।

iv) आग्नेय चट्टानें खेदार होती हैं, किन्तु खों का आकार मैग्मा के ठण्डा होने की गति पर निर्भर करता है।

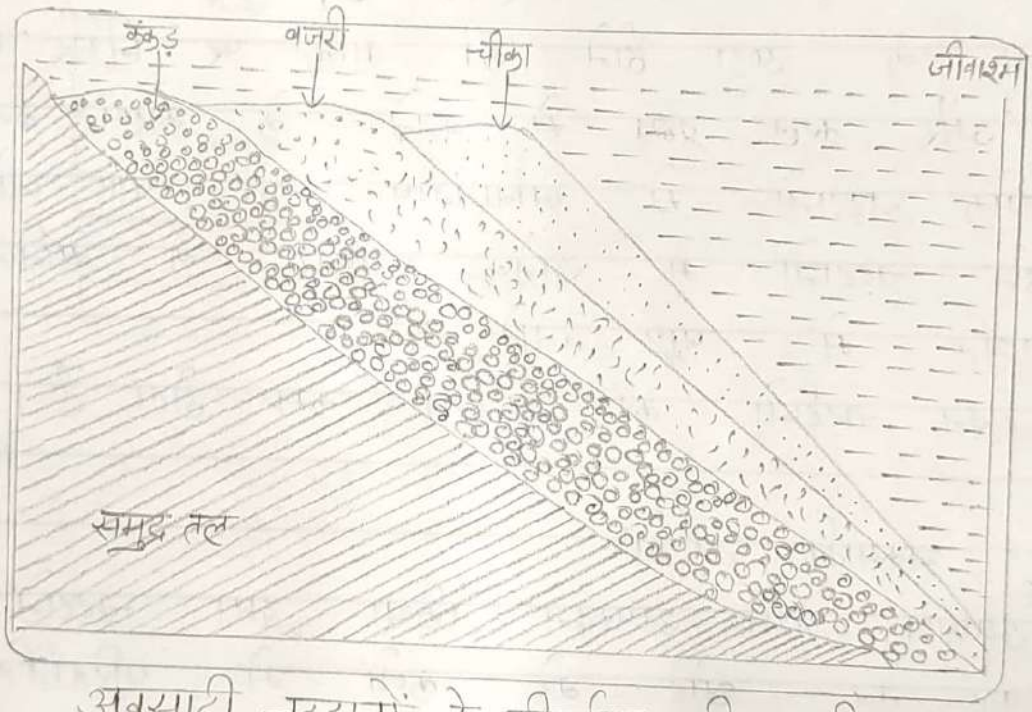
v) तप्त और तरल द्रव्य से बनने के कारण इन प्राथमिक चट्टानों में जीवावशेष नहीं पाए जाते।

vi) इन चट्टानों में अनेक प्रकार के खनिज बहुतायत में पाए जाते हैं।

vii) इन चट्टानों का अपक्षय कम होता है।

अवसादी चट्टानें

* अपक्षय तथा अपरदन क्रिया द्वारा चट्टानें टूट-फूट कर छोटे - बड़े कणों में परिवर्तित होती रहती हैं जिसे अवसाद कहते हैं। अनाच्छादन के साधन लाखों वर्षों तक इस अवसाद को परतों में जमा करते रहते हैं। कालांतर में ये परतें ठोस होकर अवसादी चट्टानें बनती हैं। स्तरों में मिलने के कारण इन्हें स्तरित चट्टानें भी कहा जाता है।



अवसादी चट्टानों के निर्माण की प्रक्रिया

अवसादी चट्टानें

संरचना के आधार पर

- निर्जीव अवसादी चट्टानें
  - यांत्रिक क्रिया से बनी
    - बालू - प्रधान
      - उदाहरण: बलुआ पत्थर
  - रासायनिक क्रिया से बनी
    - उदाहरण: सेंधा नमक, जिप्सम
- जैव अवसादी चट्टानें
  - चूना - प्रधान
    - उदाहरण: चूना पत्थर, शेलखड़ी, खड़िया
  - चीका प्रधान
    - उदाहरण: शैल, क्ले

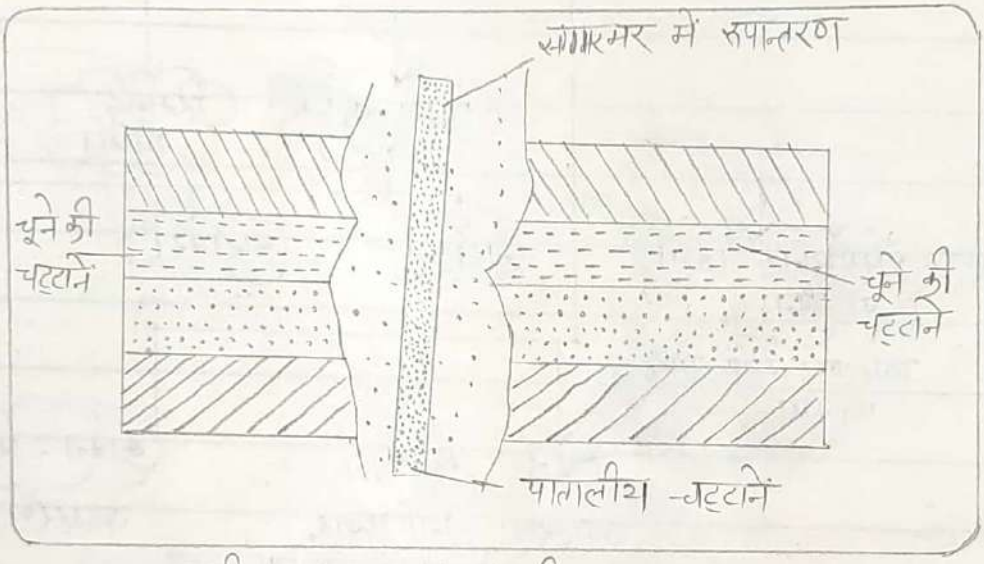
निर्माणकारी साधनों के आधार पर

- जलीय चट्टानें
  - नदीकृत
  - सरोवरी
- हिमनद निर्मित
- वायु निर्मित
  - समुद्री
- कार्बन - प्रधान
  - उदाहरण: कोयला

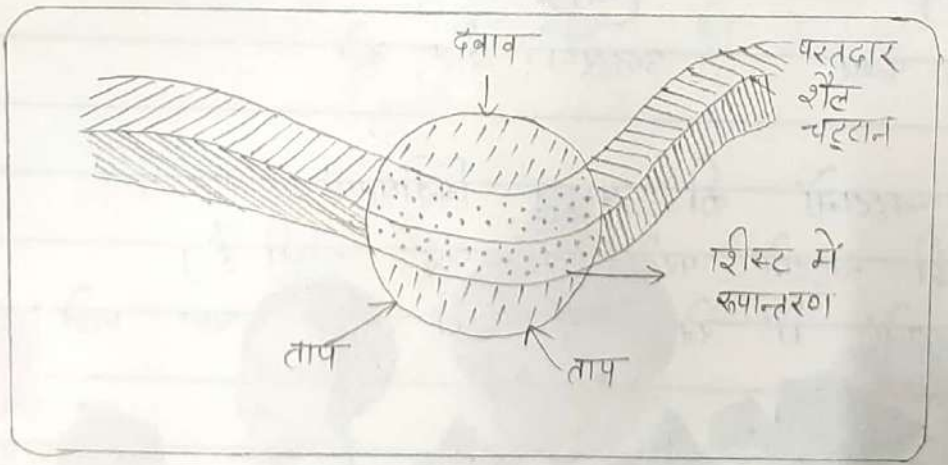
* अवसादी चट्टानों की प्रमुख विशेषताएँ –

i) अवसादी चट्टानें परतों में पाई जाती हैं।

ii) इन चट्टानों में रंध्र नहीं पाए जाते।



तापीय अथवा स्पर्श रूपान्तरण



* रूपांतरित या कायान्तरित चट्टानें

Metamorphic = Meta = Change, Morphe = Form

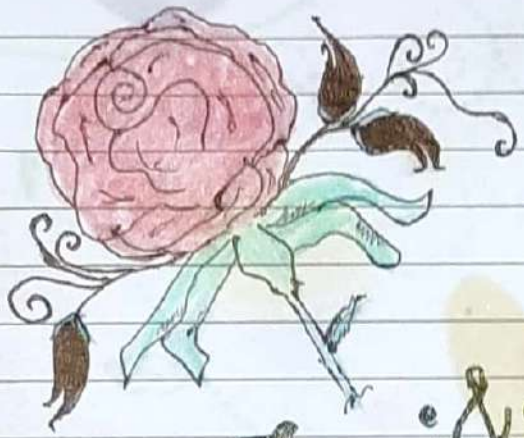
ग्रीक भाषा के दो पदों से मिलकर बना हुआ है: तथा अर्थात् ऐसी चट्टानें जो अन्य चट्टानों के रूप परिवर्तन द्वारा बनती हैं, रूपान्तरित चट्टानें कहलाती हैं।

रूपान्तरित चट्टानें

- साधन के आधार पर
  - तापीय रूपान्तरण — उदाहरण: बलुआ-पत्थर का क्वार्टजाइट
  - गतिक रूपान्तरण — उदाहरण: ग्रेनाइट का नीस
- प्रभाव-क्षेत्र के आधार पर
  - स्पर्श रूपान्तरण
  - प्रादेशिक रूपान्तरण

* चट्टानी चक्र :-

Topic ..... Date .....



Monika Sharma...

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Roll No - 21586201145.

Geography Project...

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:- पवन के कार्य एवं वातज स्थलाकृतियाँ :-

★ पवन : अर्थ एवं कार्य-क्षेत्र :-

भू-पृष्ठ पर क्षैतिज दिशा में बहती हुई वायु राशि को पवन कहा जाता है। अनावृछादन के साधन के रूप में पवन का कार्य केवल शुष्क व अर्ध-शुष्क क्षेत्रों में ही सीमित रहता है। जो मुख्यतः उष्ण व शीतोष्ण प्रदेशों में पाए जाते हैं। पवन के अपरदन और निक्षेपण से बनी स्थलाकृति को वातज स्थलाकृति कहा जाता है।

★ पवन के कार्य दोन :-

नदियों व हिमनदियों की भाँति पवनें भी अपरदन, परिवहन और निक्षेपण का कार्य करती है, किन्तु तल सन्तुलन के कारक के रूप में पवन अन्य कारकों से भिन्न है।

विशेषताएँ :-

(i) नदी और हिमनदी की भाँति पवन के कार्य पर गुरुत्व बल का अपेक्षाकृत कम असर पड़ता है।

(ii) पवन का कार्य मरुस्थलों और अर्ध-शुष्क क्षेत्रों तक ही सीमित रहता है।

Topic _____ Date 2.

(iii) पवन अपरदन की लम्बी अवधि चट्टानों में विचित्र रूप पैदा करती है।

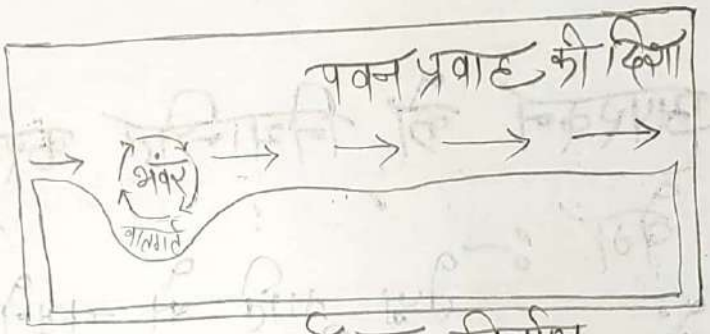
(iv) पवन आर्द्रता और वनस्पति के अभाव वाले क्षेत्रों में कार्य करती है, क्योंकि यहाँ मिट्टी के कण ढीले मिलते हैं।

★ पवन अपरदन को नियन्त्रित करने वाले कारक:-

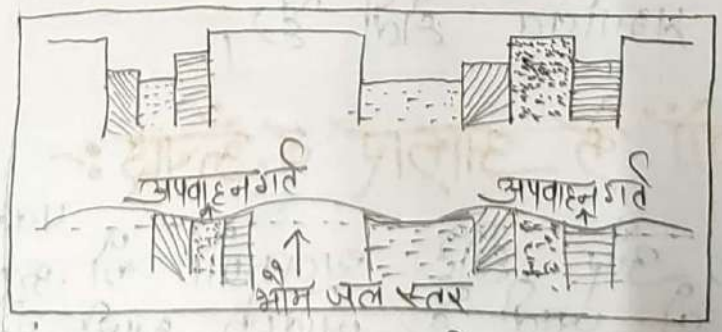
1. पवन वेग :- तेज गति से चलने वाली पवनों में अपरदन की क्षमता अधिक होती है। यदि ऐसे आँधी-तूफानों की अवधि भी लम्बी हो तो अपरदन और अधिक होता है।

2. शैल संरचना :- वातीय अपरदन की मात्रा चट्टानों की प्रकृति (कोमल या कठोर), सन्धियों और उनके कणों के संघटन से भी प्रभावित होती है।

3. धूलकणों के आकार व ऊँचाई :- पवन हल्के और छोटे धूलकणों को ऊपर उठा पर ले जाती है जबकि भारी और मोटे कण धरातल पर



वातगर्त का निर्माण



अपवाह गर्त

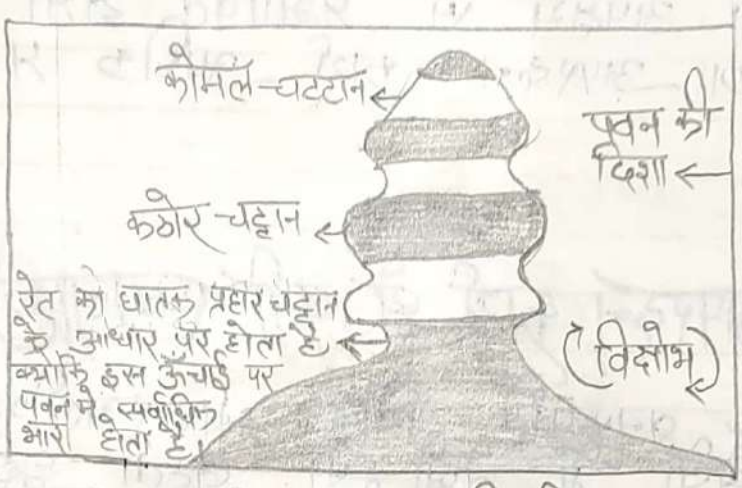
घिसते हैं। यही 6 फुट से नीचे वाले रेत ही ज्यादा अपरदन करते हैं।

4. जलवायु :-
जलवायु का अपक्षय पर प्रभाव पड़ता है। अपक्षय से प्रभावित क्षेत्रों में ही पवन का अपरदन कार्य अधिक प्रभावशील होता है।

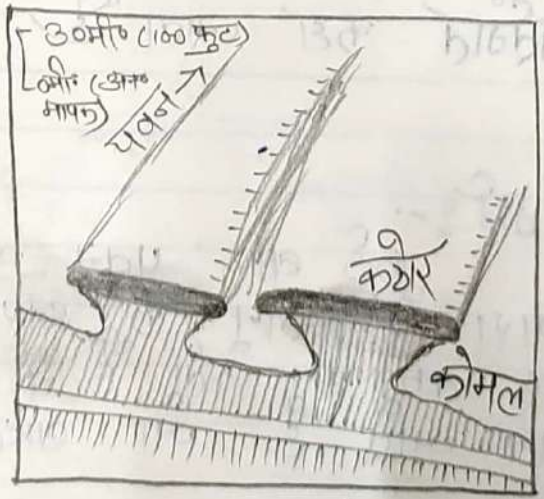
★ पवन के अपरदन कार्य से बनी स्थलाकृतियाँ :-

1. वातगर्त :- वनस्पति विहीन मरुस्थलीय क्षेत्रों में तेजी से बहती हुई पवन में भँवर पैदा हो जाते हैं और वृत्ताकार ढंग से घूमने लगती है। घूमती हुई पवन रेत में दलन कार्य करती है जिससे धरातल पर तश्तरी जैसी आकृति के उथले, चौड़े गर्त बन जाते हैं, जिन्हें वातगर्त कहा जाता है।

2. अपवाहन गर्त :-
कई बार पवन अपनी अपवाहन क्रिया द्वारा रेगिस्तान के धरातल की रेत जल स्तर तक हटा देती है। इससे विशाल गर्त बन जाते हैं जो बाद में



छत्रक का निर्माण



उन्मूलन

मरूद्यान (Oasis) के रूप में विकसित हो जाते हैं। यहां वनस्पति लहलहाने लगती है। मिस्त्र का एक ऐसा ही गर्त फयूम गर्त समुद्र तल से 50 मीटर नीचा है।

3. छत्रक या गार :-

मरूस्थलों में पवन के मार्ग में पड़ने वाली चट्टानों के आधार तल पर अपरदन सबसे अधिक होता है, क्योंकि पवन में बड़े व भारी कण धरातल के समीप बहते रहते हैं। बड़े कण ऊपर के सूक्ष्म कणों की अपेक्षा चट्टान के निचले भाग में तेजी से अपरदन करते हैं। इस अधोरदन (Undercutting) के कारण चट्टान का निचला भाग सुकड़ा और ऊपरी भाग चौड़ा बना रहता है। ऐसा भू-आकार दूर से छतरी जैसा दिखाई पड़ता है।

4. ज़्यूजन :-

मरूस्थलों में जब कोमल और कठोर चट्टानें एक-दूसरे के ऊपर क्षैतिज अवस्था में बारी-बारी बिछी होती है, तो अपक्षय के कारण ऊपरी कठोर चट्टान की सन्धियों का विस्तार होने लगता है। पवन की अपरदन क्रिया से सन्धियों से नीचे की कोमल चट्टान

यारडांग

का अपक्षय आसानी से हो जाता है और पवन उस शैल चूर्ण को उड़ा ले जाती है। कोमल शैल की पूरत जब अपरदन द्वारा समाप्त हो जाती है, तो उसके नीचे की कठोर चट्टान पर अपक्षय की पुनरावृत्ति होने लगती है। इस तरह अपक्षय और अपरदन की भिन्नता के कारण 'कुक्' और खांचे' जैसे स्थलाकृति बन जाती है, जिसे ज्यूजन कहा जाता है।

5. यारडांग :-

शुष्क प्रदेशों में कुछ स्थानों पर कोमल तथा कठोर लम्बवृत दिशा में एक-दूसरे के समान्तर खड़ी होती है। पवन कोमल चट्टानों का अपरदन शीघ्र कर देती है जबकि कठोर चट्टानें नुकीली कटकों के रूप में खड़ी रहती है। इन्हें यारडांग कहते है। इनकी ऊंचाई 50-60 मीटर तक होती है।

6. पुल :-

अपरदन के कारण पवन खिड़की धीरे-धीरे नीचे तल अर्थात आधार तक कट जाती है तब मेहराब जैसी भू-आकृति बनती है जिसमें शिला की छत पुल की तरह बची रहती है।

Date 4 April 2019 Topic Geography Page No.

KALPANA

CLASS → BA 1ST

ROLL NO. 2158620002

SEM. - 2ND

Teacher's Signature

Topic..... Date.....

भौतिक भूगोल

* भौतिक भूगोल का अर्थ :-

भौतिक भूगोल, भूगोल की वह शाखा है जिसमें पृथ्वी तल पर पाए जाने वाले भौतिक वातावरण के तत्वों का अध्ययन किया जाता है, भौतिक भूगोल कहलाता है। भौतिक भूगोल तत्वों में भू-आकार, चट्टानें, नदियां, जलवायु, वनस्पति, प्राकृतिक वनस्पति, खनिज इत्यादि आते है। प्राकृतिक तत्वों का निर्माण प्रकृति करती है, मनुष्य का इसमें कोई हाथ नहीं होता।

* परिभाषाएं :-

1. ए० के० लोबेक के अनुसार "भौतिक वातावरण का अध्ययन ही भौतिक भूगोल है।

2. टॉर तथा वॉन एंजेलन के अनुसार "पृथ्वी पर भौतिक तत्वों तथा उनके मानव पर प्रभाव का अध्ययन ही भौतिक भूगोल है।

* भौतिक भूगोल की प्रकृति व विषय-वस्तु :-

भौतिक भूगोल, भूगोल की एक महत्वपूर्ण शाखा मानी जाती है। इसके अन्तर्गत भौतिक तत्वों तथा भौतिक परिस्थितियों के गुणों और स्वरूप का अध्ययन किया जाता है। इसमें पृथ्वी पर केवल भौतिक तत्वों के वितरण का ही अध्ययन नहीं किया जाता बल्कि समय के साथ-2 इन तत्वों और दशाओं में होने वाले परिवर्तनों का भी अध्ययन किया जाता है। भौतिक भूगोल के महत्व को उजागर करते हुए भूगोलवेत्ता फिलिप लैक ने कहा

कि "भूगोल एक वृहद वृक्ष है जिसकी जड़े भौतिक भूगोल की मिट्टी में दबी हैं।"

⇒ प्रसिद्ध जर्मन दार्शनिक इमैन्युअल कांट ने तो यहाँ तक कहा है कि, "भौतिक भूगोल न केवल भूगोल का अपितु विश्व के ज्ञान का प्रथम चरण है। विश्व के वस्तु-बोध के लिए इसका प्रारम्भिक ज्ञान अनिवार्य है।"

भौतिक भूगोल की विषयवस्तु इस प्रकार है –

1. पृथ्वी के ग्रहीय सम्बन्ध :-

भौतिक भूगोल के अन्तर्गत पृथ्वी तथा सौरमण्डल का अध्ययन किया जाता है। पृथ्वी की उत्पति, आयु, पृथ्वी का अन्य ग्रहों से सम्बन्ध, पृथ्वी की गतियाँ, इसकी गुरूत्वाकर्षण शक्ति, पृथ्वी की स्थिति, पृथ्वी का घुर्णन, परिक्रमा इत्यादि का अध्ययन भी भौतिक भूगोल की विषय वस्तु के अन्तर्गत आते है।

2. स्थलमण्डल :-

यह पृथ्वी का ऊपरी ठोस भाग है। इसके अन्तर्गत विभिन्न प्रकार के स्थल रूपों; जैसे पर्वत, पठार मैदान के अध्ययन के साथ-साथ इन पर पाए जाने वाले सूक्ष्म भू-आकारों का भी अध्ययन किया जाता है; जैसे टीले, सर्क, गोखुर झील डेल्टा इत्यादि। स्थलमण्डल में उन अवस्थाओं व प्रक्रियाओं का भी अध्ययन किया जाता है जिसकी वजह से यह धरातल अपनी वर्तमान दशा में पहुँचा हुआ है।

Topic ..... Date.....

3. जलमण्डल :-

जलमण्डल में पृथ्वी के समस्त जलीय भाग आते हैं। अतः जलमण्डल के अन्तर्गत महासागरीय नितल का विन्यास, महासागरीय निक्षेप, सागरों और महासागरों के जल का तापमान, लवणता, घनत्व, जल संचरण, ज्वार-भाटा, जल चक्र तथा प्रवाल भित्तियों आदि तथ्यों का अध्ययन किया जाता है।

4. वायुमण्डल :-

इसके अन्तर्गत वायु से जुड़े तथ्यों जैसे - वायुमण्डल की संरचना, संघटन, तापमान, वायुदाब, पवन पेटियाँ, पवनों की उत्पति एवं प्रकार, आर्द्रता के विभिन्न रूप, वायु-राशियाँ, वायु-विक्षोभ तथा विश्व जलवायु का वर्गीकरण एवं वितरण आदि का अध्यन किया जाता है। ध्यान रहे कि वायुमण्डल में केवल उन्हीं तथ्यों का अध्ययन किया जाता है जहाँ तक वे स्थल, जल और जैव जीवन को प्रभावित करते हैं।

5. जैवमण्डल :-

पृथ्वी का वह भाग जहाँ जीवन पाया जाता है, जैवमण्डल कहलाता है। जैवमण्डल क्षैतिज रूप से सारे भूमण्डल पर और लम्बवत् रूप से सागरों की गहराई से लेकर वायुमण्डल की ऊँचाई तक, जहाँ-2 जीवन सम्भव है, फैला हुआ है। जैवमण्डल के अन्तर्गत सभी प्रकार के जीवों की उत्पति, उनका विकास क्रम, वितरण, पर्यावास तथा उनके जीवन चक्र को प्रभावित करने वाली दशाओं का अध्ययन किया जाता है।

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* भौतिक भूगोल का विज्ञान की अन्य शाखाओं से सम्बन्ध

भौतिक भूगोल अपने आप में एक स्वतंत्र विज्ञान नहीं है। ए० एच० स्ट्राहलर तथा ए० एन० स्ट्राहलर के शब्दों में "भौतिक भूगोल अपनी अन्तर्वस्तु के लिए अन्य प्राकृतिक विज्ञानों पर निर्भर करता है।"
यही वजह है कि आज लगभग सभी भू-विज्ञान भूगोल की उप-शाखा के रूप में प्रतिष्ठित है -

1. खगोल विज्ञान :-
ब्रह्माण्ड की उत्पति, इसमें व्याप्त अनेक सौरमण्डल, प्रत्येक सौरमण्डल में उपस्थित अनेक तारें व अन्य आकाशीय पिण्ड, उनकी गतियाँ, सूर्य की किरणों का उतरायण व दक्षिणायन होना, ऋतु-परिवर्तन, दिन-रात का होना जैसी अनेक प्राकृतिक घटनाओं के समुचित उत्तर खगोलीय भूगोल में दिए जाते हैं। खगोलीय भूगोल गणित और भौतिकी का अनुसरण करता है।

2. गणित :-
विभिन्न स्थानों पर समय और अन्तराल की गणना, अक्षांश-देशांतर के निर्धारण, सांख्यिकीय आरेखों, प्रक्षेपों व ग्राफ़ इत्यादि की रचना गणितीय भूगोल में की जाती है। भूतल पर होने वाले समस्त आर्थिक क्रियाओं व जनसंख्या की विशेषताओं का अध्ययन गणित के बिना सम्भव नहीं।

3. भौतिकी :-
भौतिकी के नियमों का ज्ञान पृथ्वी की गतियों, ज्वालामुखी, भूकम्प, ज्वार-भाटा, अपक्षय और

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अपरदन जैसी अनेक प्रक्रियाओं को समझने में भूगोल की सहायता करता है।

4. भू-गर्भ विज्ञान :-

भू-गर्भ विज्ञान पृथ्वी की उत्पति, भू-आकृतियों का निर्माण, खनिजों व चट्टानों की उत्पति, भूकम्प ज्वालामुखी जैसी घटनाओं का अध्ययन करता है। भूगोल इन तत्वों के वितरण और मानव पर इनके प्रभावों का अध्ययन करता है।

5. रसायन विज्ञान :-

वायुमण्डल की विभिन्न गैसों, खनिजों, ऊर्जा के संसाधनों, मृदा व चट्टानों के गुणों के बारे में जानकारी हेतु भूगोल रसायन विज्ञान पर निर्भर रहता है।

6. वनस्पति विज्ञान :-

भूगोल वनस्पति के प्रकार और उसके आर्थिक महत्व का अध्ययन करता है। वनस्पति शास्त्र में वृक्षों व पादप-समूह की जीवनी का अध्ययन किया जाता है। वनस्पति जगत के आधारभूत ज्ञान के लिए भूगोल वनस्पति

7. प्राणी विज्ञान :-

प्राणी विज्ञान जन्तुओं की विभिन्न प्रजातियों व उनके जीवन के बारे में अध्ययन करता है। भूगोल स्थलमण्डल, जलमण्डल व वायुमण्डल में पाए जाने वाले जीव-जन्तुओं पर भौगोलिक तत्वों के प्रभाव और पर्यावरण के साथ उनके अन्तर्सम्बन्धों का अध्ययन करता है।

जलवायु विज्ञान और मौसम विज्ञान :-

8. इन विज्ञानों में तापमान, भूमण्डलीय ताप सन्तुलन वर्षा, वायुभार, दाब कटिबन्धों, पवन पेटियों, पवन व्यवस्थाओं, वायु-राशियों, वायुमण्डल के संघटन व संरचना के साथ-साथ मौसमी घटनाओं बादल, वाष्पीकरण, धुंध, कुहरा, आंधियों चक्रवात इत्यादि की उत्पति मूलक दशाओं व उनके जुड़े नियमों व सिद्धान्तों का अध्ययन किया जाता है।

समुद्र विज्ञान - भौतिक समुद्र विज्ञान :-

9. समुद्र विज्ञान - भौतिक समुद्र विज्ञान में समुद्री भू-आकृति, भू-पर्पटी तथा मेंटल की उत्पति एवं संरचना, महासागरीय निक्षेप तथा महासागरीय नितल के उच्चावच का अध्ययन किया जाता है। इसके अतिरिक्त इस विज्ञान में जल के भौतिक लक्षणों; जैसे तापमान, दाब, लवणता तथा घनत्व इत्यादि तथा उसके गतिक लक्षणों; जैसे समुद्री तरंगें, धाराएँ, ज्वार-भाटा आदि का अध्ययन किया जाता है।

मृदा विज्ञान :-

10. मृदा विज्ञान मृदा की संरचना, विकास, वर्गीकरण तथा उसकी उर्वरता का वैज्ञानिक अध्ययन करता है। भौतिक भूगोल में इन सभी तत्वों के अतिरिक्त मिट्टी के प्रादेशिक वितरण तथा उसके उपयोग को भी सम्मानजनक स्थान प्राप्त है।

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Name - Sahil

Roll no - 3039910060

Class - B.A. IInd year

Assignment - English

Teacher Name - Neelam Madan

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Q-1 → What is a Sonnet? What are the two kind of Sonnet?

Ans → A Sonnet is a poem made up of fourteen lines. The Sonnet was developed in Italy. The Sonnet can be of two kind.

1. →

The Italian or Petrarchan Sonnet. It is divide into two parts:

(a) An octave

(the first eight the lines of the poem) having a rhyme Scheme of abba abba, and

(b) A Sestet

(the final six lines) following a rhyme Scheme of cde cde or cd cd cd.

2. →

The English or Shakespearean Sonnet. It was introduced by thomas wyatt and the earl of Surrey into English Poetry in the first half of the Sixteenth century. The English Sonnet of the Shakespearean Sonnet differs from the Petrarchan Sonnet in some fundamental ways. The Shakespearean Sonnet is usually written in Iambic Pentameter.

Title _____ Date _____ Page No. _____

Q→ What is a Dramatic monologue?

Ans→ Dramatic monologue is a kind of lyric Poem in which there is a single Speaker who is not the Poet. He utters the Speech, in a specific situation at a critical moment. This Person / Speaker addresses and interacts with the silent listener whose role and reactions are inferred from the Speaker's words. In the course of his Speech, the Speaker reveals his temperament and character to the reader. The focus of interest in a dramatic lyric is on the Speaker's elaborate argument rather than on the character revelation.

Q→ Write a brief note on the free verse?

Ans→ Free verse, as the name Suggests, is an free from of Poetry. It does not have a regular meter or line length. It follows the rhythm Speech. A regular Pattern of Sound or rhythm may emerge in free verse lines. But the Poet does not fallow any regular matrical Scheme. It rhymes are based on patterned elements Such as Sound, words, Phrases,

Title _____ Date _____ Page No. _____

Sentences and Paragraphs. Free verse, thus eliminates much of the artificiality of Poetic expression. Free verse become current in english poetics in the early twentieth century.

Q→ write a brief note on the Poetic from 'lyric'. what are the main features of a lyric?

Ans→ A lyric is any fairly short Poem, not often longer than fifty or sixty lines. It expresses the fellings and thoughts of a single speaker in a Personal and subjective manner. the lyric is the uttered in the first Person. The range and variety of lyric verse is immense and lyric Poetry comprises the bulk of all Poetry.

The following are the main features of a lyric→

1. It is a short musical Poem dealing with a single emotion.
2. It is a subjective and intensely Person Poem.

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Q:- What is an ode?

Ans:- An ode is a long lyric Poem. It has an elaborate stanza structure and an elevated style. Its subject matter and treatment is serious. It expresses high sentiments and thought. It is marked by formality and stateliness in tone and style, making it ceremonial in nature. It can be Public or Private. The public is used for ceremonial occasions like funerals, birthday, State events, etc. e.g. Tennyson's ode on the death of the duke of wellington. The Private is meditative and reflective, it celebrates intense, Personal and subjective occasions - e.g. Keats 'ode to a Nightingal'.

A

PROJECT WORK

ON

ECONOMIC IMPORTANCE

OF

ALGAE AND FUNGI

Page No.
Date

CERTIFICATE

This is to certify Mamta class B.Sc I (Medical) has successfully completed the investigatory project on the topic Economic Importance of Algae and Fungi under the guidence of Mrs. Sadhna Yadav during the year 2019-20 in the partial fulfillment of botany practical examination.

Mamta
Class - B.Sc I (Medical)
Roll No. - 4705420009
Govt. College Satnali
Mahendergarh

Page No.
Date

ACKNOWLEDGEMENT

In the accomplishment of this project successfully, many people have best owned upon me their blessing and the heart pledged support, this time I am utilizing to thank all the people who have been concerned with the project.

I want to thank my subject teacher Ms. Sadhna Yadav whose valuable guidence has been the ones that help me patch this project.

Economic Importance of Algae -

Algae are of great economic use to mankind. By their photosynthetic activity these plants not only provide organic food but also purify atmospheric oxygen.

Useful Activities -

A. Algae As Food -

Algae are important source of food for fishes, aquatic amphibians, mammals and other animals. Since man is dependent on aquatic life for his food supplements, therefore algae are indirectly important to man.

A few are listed here -

1. In India Spirogyra, Oedogonium and in Europe Ulva are derived and processed as food products.
2. Chlorella is a green algae possessing about 50% proteins, 20% lipids and carbohydrates, vitamin A, B, C and K. It is used as dried food.
3. In parific Islands young stips of Laminaria called 'Kambu' are eaten directly.

B. Role In Industry -

1. Agar agar - It is a mucilage, produced and stored in the cell wall of certain red algae. Japan is the larger producer of agar.

2. Alginic acid - Algin is a carbohydrate, which occurs in cell wall of seaweeds such as Ascophyllum Laminaria etc. It is a colloidal material, its insoluble extract is alginic acid.
3. Carrageenin - It is a mucilagenous polysaccharide extracted from cell wall of some red algae such as Grigartina.
4. Iodine and Bromine - Japan produces about 100 tons of iodine annually from kelps. Source of bromine are some of red algae like Rhodomela, polysiphonia.
5. Glue - It is an another industry in Japan. Glue also called 'funori' is extracted from red algae.
6. Minerals and elements - Many types of sea weed are used to obtain copper, chromium, cobalt, potash etc.

C. Role In Medicines -

Many algae yield substance of medicinal application.

1. An antibiotic chlorellin was obtained from Chlorella which is used against some bacterial infections.
2. Iodine used in medicines for goitre.
3. Several vitamins A, B and C are obtained from algae.
4. Carrageen in extract acts as blood coagulant.

D. Role In Agriculture-

Algae is useful in various ways-

1. Fertilizers and manure- Large brown and red algae growing as sea weeds are used as fertilizers chiefly to the farm lands near the coastal region.
2. Soil formation- Some algae are a part of lichens, which are the pioneers of plant succession and help in soil formation.

E. Algae As Fodder-

Most of the sea weeds, such as Fucus, Laminaria are used as fodder for sheep, goat, cattle and poultry etc.

Use of algae as fodder results in

(i) increased egg lying capacity of poultry.
(ii) increased iodine and carotene contents of egg yolks.

F. Algae As Space Travel-

In recent years, biologists have constructed a system of utilize algae during a space flight trip to get rid of CO_2 and other body wastes. It will also be used as a food. Ex. chlorella, pyrenoidosa and synococcus multiplies rapidly to synthesize rich harvest by utilizing CO_2.

Harmful Activities -

A. Toxicity -

Many algae produces some toxic substances which affect the marine or aquatic forms.

B. Parasitic Algae -

Some algae grow parasitically on other plants, animals or human beings and cause various disease in them.

(a) Chorella may cause skin infections.
(b) Blastodinium grows in guts of cope-pods.

C. Algae Causing Damage -

Algae may cause serious damage to historical buildings, metals and wood works of ships and boats, textile and tents and foodstuffs.

D. Pollution in Water Supply -

Some algae like spirogyra, diatoms grow in water reservoirs or channals and clog water filters. They change taste and odour of water by changing pH, CO_2 and O_2 conc. of water.

Economic Importance of Fungi -

Useful Activities -

1. In Agriculture -

(i) Soil Festility -

Some fungi maintain the festility of soil particularly in acidic soils where bacterial activity is minimum, by bringing about decay and decomposition of complex organic compounds into simples ones by their enzymatic activity.

(ii) Decomposers -

Many saprophytic fungi decompose plants and animals debris into simples organic and inorganic compounds and gases, which again become available in the soil and air for plant growth.

(iii) Mycorrhiza -

A symbiotic association of fungi with the roots of higher plants is called mycorrhiza and it may be ecto or endo mycorrhiza. Mycorrhizal roots are generally resistant to infections e.g Pinus roots with fungi.

(iv) Soil Aggregation -

Aspergillus, Cladosporium, Penicillium have soil binding properties and secrete mucilage which cause soil aggregation.

2. As Food -

(i) Yeast Cake -

Yeast cake are prepared by mixing a large no. of yeast cells with some inert substances such as starch and than compressed to form cakes.

(ii) Food Yeast -

Food yeast is a product containing 15% proteins and B group of vitamin manufactured by growing yeast with ammonia and molasses.

(iii) Edible Fungi -

There are about 200 species of fungi used as food. The most important fruitifications used as food are common field mushroom Dhingri.

3. In Medicines -

(i) Antibiotics -

These are organic substances produced by micro organisms, which inhibit the growth of certain other micro organisms.

Penicillium – Penicillium notatum

(ii) Vitamins -

Fungi are a rich source of vitamins. Vitamin B complex is obtained from yeasts.

4. **In Industry-**

(i) Alcoholic Fermentation-

The most common alcoholic beverage like wine from grapes, beer from barley whiskies from cereals.

(ii) Cheese Industry-

Some fungi known as cheese moulds are used to add a characteristic flavour and texture to cheese.

5. **Experimental Studies-**

Neurospora sitophila completes its sexual life cycle in few days and chance make an ideal organism for study of laws of heredity.

Harmful Activities-

1. **Allergic Fungi -**

Spores of many moulds (Mucor), fungi imperfecti and others like smuts and rusts reach throat and legs and cause different types of allergies like asthma.

2. **Fungi As Poison.**

(i) Food toxins- These cause food poisoning.

Mycotoxins production can occur in any plant product but cereals and oil seed crops.

(b) Mushroom poisoning -

Several mushrooms produce toxins and cause mushroom poisoning called mycetismus causing diarrhoea, vomiting, liver damage.

3. Aflatoxins -

These are the most potent carcinogenic agents produced by A. flavus.

GOVERNMENT COLLEGE SATNALI

SUBJECT - BOTANY

SESSION - 2020 - 21

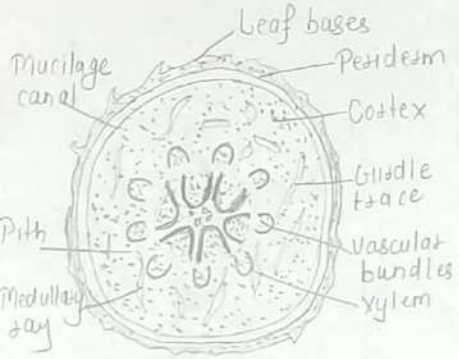
CLASS - BSc. II (MEDICAL)

ROLL NO - 4705420009

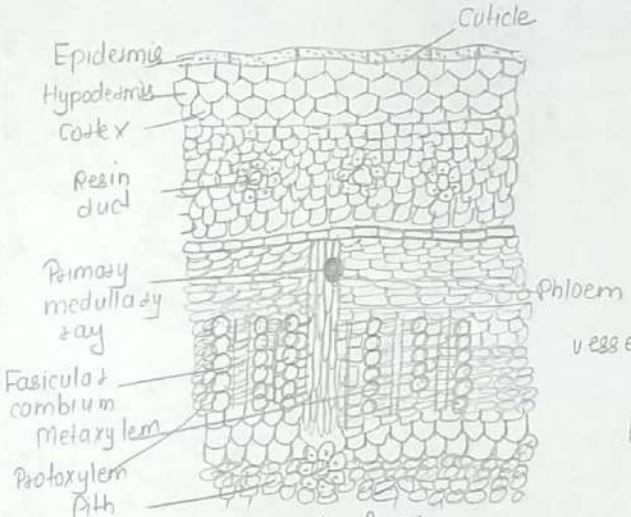
TOPIC - COMPARISON B/W CYCAS, PINUS AND EPHEDRA

SUBMITTED BY - MAMTA

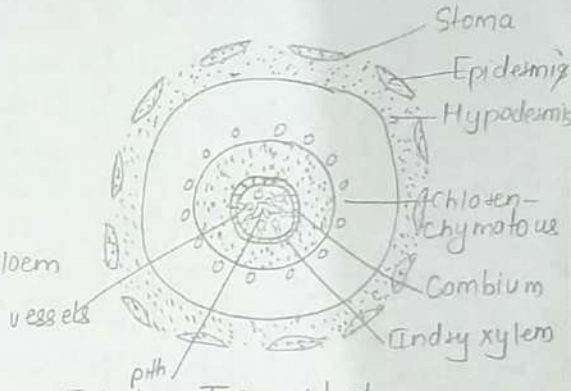
SUBMITTED TO - MRS. SADHANA YADAV



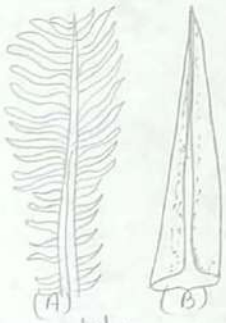
Cycas (T.S) young stem



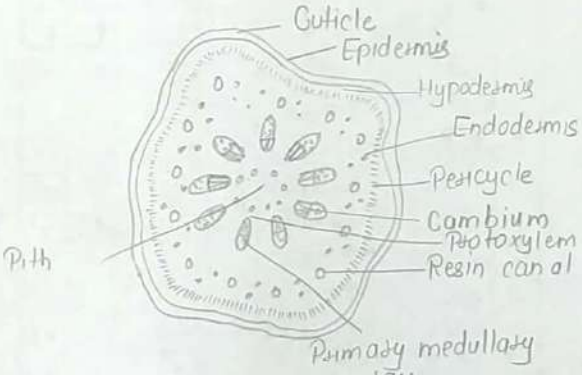
T.S Detailed part of stem



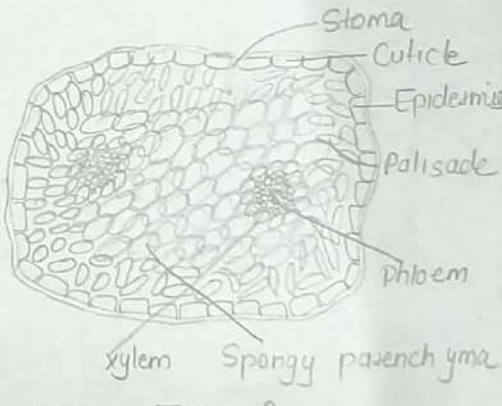
Ephedra T.S old stem



Cycas revoluta
(A) Leaf
(B) Leaflet (a part)

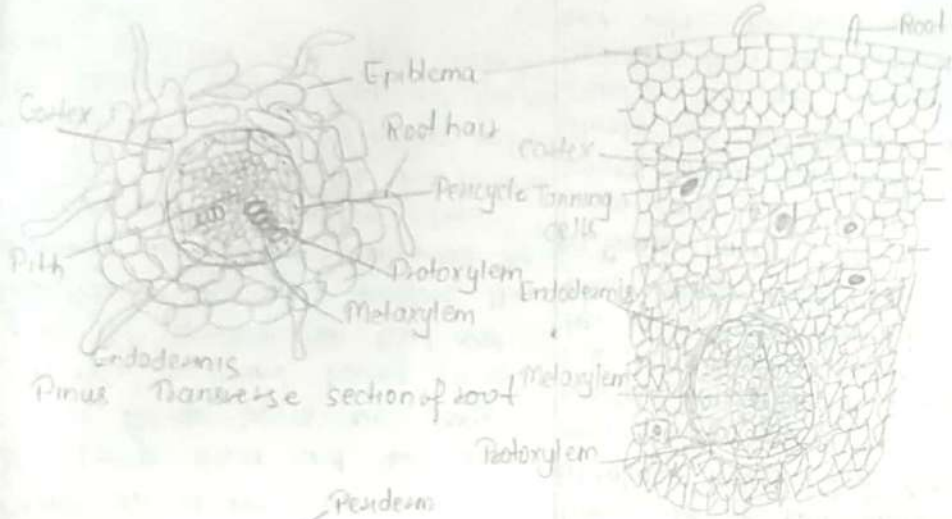


T.S primary stem of Pinus (Outline

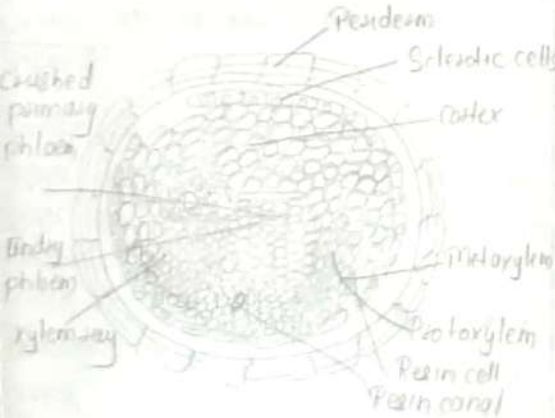


Ephedra T.S leaf

Cycas	Pinus	Ephedra
Stem → Stem is stout and remain under ground for many years. When aerial, it is unbranched and is armoured with thick persistent leaf bases. It has a wider cortex and narrow pith and stele. There is a large central parenchymatous pith. It has many mucilage canals in it.	Evergreen tall trees stem covered with scaly bark, branch are dimorphic and stem are irregular in outline. Narrow cortex and pith well developed. Cambium persisted secondary growth as in dicot vessel cambium. Medullary rays are narrow and connect the pith and cortex.	Mostly woody shrubs, much branched. Stem is differentiated into node and internode. Stem is photosynthetic. Below the epidermis occurs sclerenchyma patches below the ridges. Rest of the cortex is made up of green cells. It consists of 8-12 vascular bundles arranged in a ring.
Leaves - Leaves are of two types (dimorphic). foliage leaves and the scale leaves. Foliage leaves are large pinnately compound having 50-100 pairs of leaflets are hard and coriaceous. In cycas revolute, the margins are folded downward. The leaflets are the rachis shows circinate ptyxis is the bud condition. Scale leaves occur alternating with foliage leaves. They are brown hard, persistent and non-photosynthetic.	Leaves are of two types (Dimorphic) (a) **Foliage leaves** - These leaves are long, narrow, green and look like needles. They occur in groups of 2-5 in different species on the tip of dwarf shoot the dwarf shoot along with the needles. (b) **Scale leaves** - They are small brown and membranous. Scale leaves occur on both long shoots as well as on dwarf shoots. They are deciduous. However, they are protective and retain moisture around the stem.	The leaves are scaly but green in the young condition. **Epidermis** - It is a single layer of radially elongated cells. It is heavily cutinized. A few stomata may be seen in it. **Mesophyll** - It is differentiated into outer 1-2 layers of palisade parenchyma and inner oval spongy parenchyma. The mesophyll cells have chloroplasts, are loosely packed and do photosynthesis until they remain green.

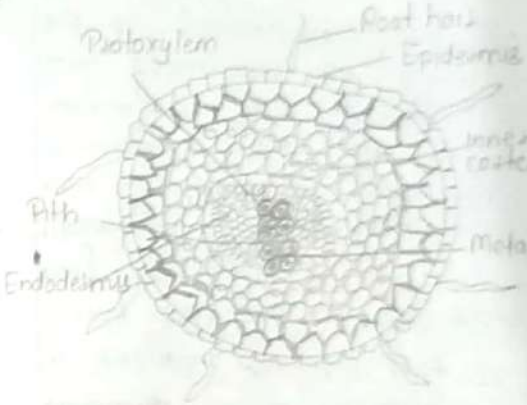


Pinus Transverse section of root



Pinus (T.S) old root.

Cycas T.S primary root



Ephedra - T.S young root

Cycas

Root –

It has a tap root system. The roots are well branched and fix the plant firmly into the soil. They are repeatdly branched like corals and are called coralloid roots.

Internal Structure –

Primary root structure – The outermost layer is epidermis. It has unicellular hair on it. Next is a thin cortex made up of parenchymatous cells. Innermost layer of cortex is endodermis followed by a single layered pericycle. A pith may or may not present in the centre.

Secondary growth in the root – There is no cambium in the primary structure of root. Cambium arises outside the protoxylem and inside the phloem. It cuts the secondary xylem on its inner side and secondary phloem on its outer side soon the rings become circular. Primary phloem is however crushed and not seen in a natural root.

Pinus

when a plant is growing on a shallow soil in the hills, the lateral roots spread very wide to fix the plant firmly into the soil.

Primary structure –

Epidermis – It is a single layer of cells. Some cells may have root hair on it.

Cortex – Four to six layers of parenchyma form the cortex. They are thin walled.

Pericycle – It occurs inner to endodermis and is many layered.

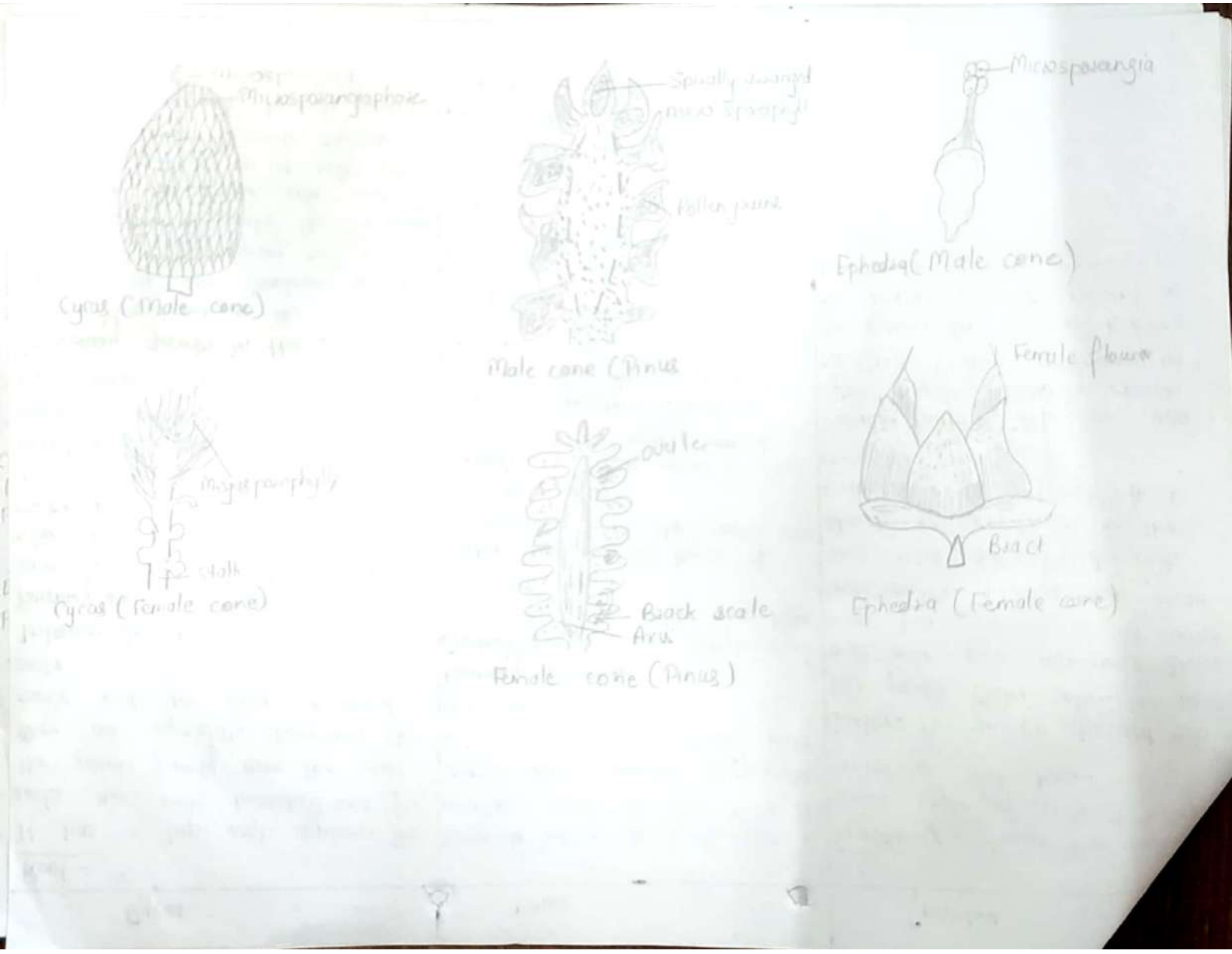
Secondary growth – Secondary growth occurs in pinus root like in a dicot root. primary root does not have cambium in it. But cambium appears from the cells of pericycle outside protoxylem and from cells of conjunctive cells inside the phloem. In this way, a zigzag ring of cambium is formed. The ring cuts off new cells on its both the faeces.

Ephedra

Epidermis – It is the outermost single layer of cells. It has unicellular root hair.

Cortex – It can be divided into two parts. Outer collenchymatous and inner parenchymatous. Innermost layer of cortex is called endodermis. It is very clear and cells are filled with starch grains. Inner to the endodermis is 2-3 cell thick pericycle.

Vascular bundle – There are two xylem bundles showing exarch condition. Phloem alternates with the xylem. So vascular bundles are radial. Pith is present in the centre. It has parenchymatous.



Cycas

Reproduction -

Vegetative reproduction common by bulbils. Plant are dioecious. Spore bearing structure are compact in male cone and loose in female cone.

Male cone - The male cone of cycas is a large, woody oval structure produced terminally on the male plant. The male cone is about 50cm long and is largest in whole plant kingdom. It has a central axis on which microsporophylls are arranged spirally.

Microsporangia are unicellular.

Female cone -

No distinct female cone.

Each megasporophyll bear 1-5 naked megasporangium in pair.

Integument is slightly longer than ovule.

Pinus

Plants are monoecious but monosporangiate cone.

Spore bearing structure are compact cones.

Male cones -

Male cones are small, arising in the aerial of scale leaves replacing dwarf shoots on the lower branches.

Microsporangia are unicellular.

Microspores are with two wings.

Dehiscence of 3-4 celled stage.

Pollen tube is haustorial as well as sperm carried.

Male gamete are non-motile.

Female cone -

Female cones are well defined.

Bear two ovules laterally on its lower surface.

Integument is slightly longer than ovule.

Ephedra

Plants are dioecious.

Cones are compound and not compact.

Male cone -

Male cones are borne in whorls of 2-4 at each node of festile f branch.

Microsporangium are bio or tri-locular.

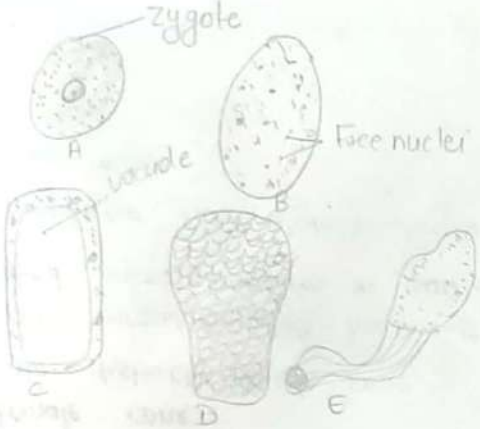
Microspores are wingless.

Female cone -

Female cones are borne in the whorls of 2-4 at each node of festile branch.

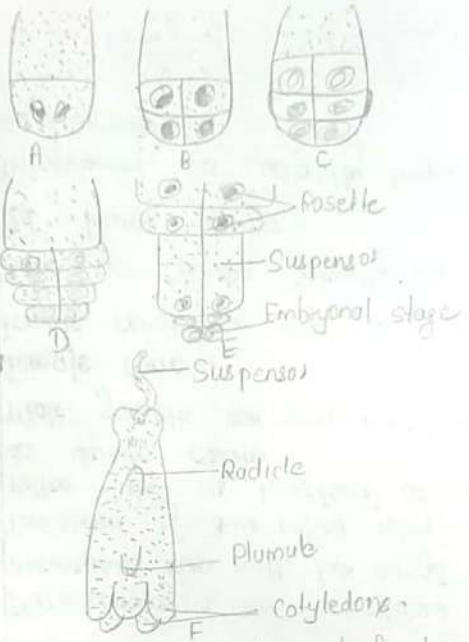
Festile branch bear two festile flowers and each flower consist of a short stalk and terminal ovule.

Inner integument is very long protrudes as micropylar end.

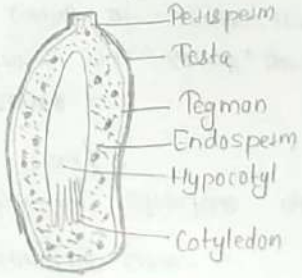


Cycas: (Development of embryo

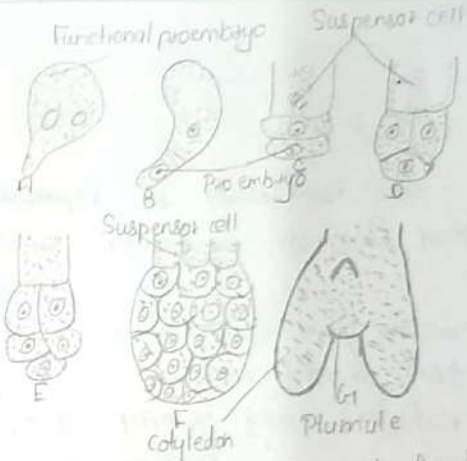
Cycas seed



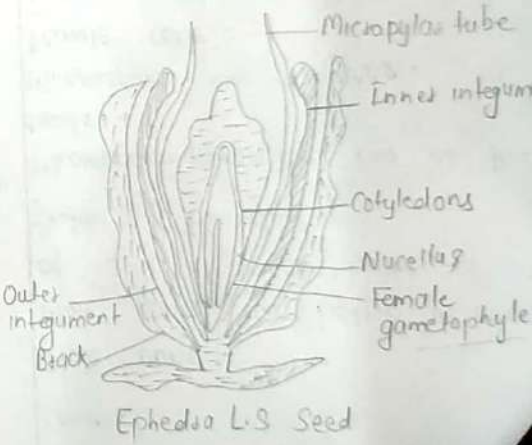
Stages in the development of embryo (Pinus)



L.S Seed (Pinus)



Stages in the development of embryo (Ephedra)



Ephedra L.S Seed

Cycas	Pinus	Ephedra
Female gametophyte –		
Archegonia are 2-6 neck 2 celled	Archegonia 2-7, 8 neck cell	Archegonia 1-3
Ventral canal nucleus disintegrates.	arranged in two tiers of 4 each.	Neck cell very long, 32 cells arranged.
Time b/w pollination and fertilization is about four months.	Ventral canal cell disintegrates.	Venter canal cell is small and persists at the upper end.
	Time b/w pollination and fertilization is more than a year.	There is no time gap.
Embryogeny –		
Zygote divide by free nuclear division then wall formation starts.	wall formation starts at nucleated stage.	Wall formation starts at nucleated stage.
Pro-embryo cells numerous.	Pro embryo 16 celled.	All 8 nuclei individually behave as pro embryo.
No rosette polyembryony.	Embryonal tier has 4 cells.	Testa – is hard and dark brown but seed is covered by thick fleshy layer of fused.
Seed – Seed coat possess outer coloured fleshy layered middle strong layered.	Rosette polyembryony is also reported.	Endoderm present.
Nucellus is completely exhausted.	Seed – Testa is hard and inner tegumen is membranous.	Seed are not winged and are formed in same years.
Seed are not winged and formed in the same year.	Nucellus is thin.	
	Seeds are winged and formed in third year.	

Date _____

Govt. Collage Satnali

Assignment of

English

Submitted by

Avina

Class ~ BA 3rd Sem.

Roll No ~ 3039926053

Submitted to ~

Nilam Mam

Date

Q.1 what is a Sonnet? what are the types of Sonnet?

Sonnet is a poem made up of fourteen lines. The Sonnet was developed in Italy. The sonnet can be of kinds.

1. The Italian of Petrarchan Sonnet. It is divided into two parts: (a) an octave (the first eight lines of the Poem) having a rhyme scheme of abba abba. and (b) a sestet (the Final six lines) following a rhyme scheme of cde cde or cd ed cd. The Petrarchan Sonnet was almost always concerned with courtly love or written in Praise of love and beauty.

2 The English or Shakespearean Sonnet. It was introduced by Thomas wyatt and the Earl of Surrey into English poetry in the first half of the Sixteenth Century. The English Sonnet or the Shakespearean Sonnet differs from the Petrarchan Sonnet in some fundamental ways. It is made up of three quatrains (for the stanzas) ending with

Date

it represents its subject as an idealised shepherd in an idelised Pastoral setting. It begins with an expression of grief and invocation to the Muse. It contains a funeral procession, a description of mourning throughout nature and musings on the inevitability of death and decay. It ends with an affirmative justification of nature's laws. Milton's Lycidas (1638) Shelley's Adonais (1821) and Arnold's Thyrsis (1867) are same notable examples of Pastoral elegy.

Elegy written in a country churchyard is an outstanding exmple which pays tribute to generations of humble and unknown villagers buried in a churchyard.

Date _____

Ans. An ode is a long lyric poem. It has an elaborate stanza structure and an elevated style. Its subject matter and treatment is serious. It expresses high sentiments and thoughts. It is marked by formality and stateliness in tone style making it birthdays in nature. It can be public or private. The public is used for ceremonial occasions like funerals. birthdays, state event, etc. Tenny son's ode on the death of the Duke of wellington.

it was established by the Greek Poet Pindar.

it was established by the introduced in 1656 by Abraham Cowley.

it was based on the odes of the Roman writer.

Date

a couplet. The rhyme scheme most usually followed is abab cdcd efef gg. The quatrains usually propose and explore an idea that the concluding couplet most often refutes or puts a different spin on it Hence.

Q4 write a brief note on Elegy and its use in poetry.

Ans. Elegy is a reflective lyic poem lamenting the death of a public personage or of a friend or a loved It is a meditative poem on the theme of human mortality. In classical literature, it covered a wide range of subjects from laments to love Poems in modern usage, the term elegy refers to the poet chooses. than to the meter. It is a poem of lamentation and can be written in any formal pattern. It represents its subject.

Pastoral elegy:-

: it is a distinct type of elegy and follows a rather formal patten.

Name : _____ Page No. : 1.

GOVERNMENT COLLEGE
SATNALI

ASSIGNMENT : ENGLISH

NAME : POOJA

CLASS : B.A. 2

ROLL NO. : 303992000 25

SUBMIT BY : POOJA

SUBMIT TO : NEELAM MAM

Q.1. What is a Sonnet? What are the two types of sonnet?

Ans ⇒ A sonnet is a poem made up of fourteen lines. The sonnet was developed in Italy. The sonnet can be of two kinds:

(1) The latian or Petrarchan sonnet. It is divided into two parts: (a) an octave having a rhyme scheme of abba, abba, and (b) a sester following a rhyme scheme of cde cde or cd cd cd.

(2) The English or Shakespearean sonnet. It was introduced by Thomas Wyatt and the Earl of Surrey into English poetry in the first half of the sixteenth century. The english sonnet or the Shakespearean sonnet different from the Petrarchan sonnet in some fundamental ways. It is made up of three quatrains ending with a couplet. The Shakespearean sonnet is usually written in iambic pentameter.

Q.2. ⇒ Write a brief note on the poetic form 'Lyric'. What are the main features of a Lyric?

Ans ⇒ A lyric is any fairly short poem, not often longer than fifty or sixty lines. It expresses the feelings and thoughts of a single speaker in a personal and subjective manner. The lyric is uttered in the first person.

The following are the main features of a lyric:

(1) It is a short musical poem dealing with a single emotion.
(2) It is a well-knit poem which expresses the varying moods of the speaker poet.
(3) It is a subjective and intensely personal poem.

The narrator in the lyric may be speaking alone, thinking aloud by himself, and in the process allowing the reader to gain an understanding of how he is feeling at a certain time or about a certain subject.

Q.3. ⇒ What is an ode? What are the three types of odes?

Ans ⇒ An ode is a long lyric poem. It has an elaborate stanza structure and an elevated style. Its subject matter and treatment is serious. It expresses high sentiments and thoughts. It is marked by formality and stateliness in tone and style., making it ceremonial in nature. It can be public or private.

★ There are three types of odes:

(1) The regular or Pindaric Ode:

It was established by the Greek poet Pindar. It was introduced into English literature by Ben Jonson. The Pindaric ode has a set structure: (a) The strophe (b) The antistrophe.

(2) Irregular Ode:

It was introduced in 1656 by Abraham Cowley. It disregarded the recurrent stanza in pattern.

(3) The Horatian Ode:

It was based on the odes of the Roman writer, Horace. It is written in a single repeated stanza form and is shorter.

Q.4 ⇒ Write a brief note on Elegy and its use in poetry?

Ans ⇒ Elegy is a reflective lyric poem lamenting the death of a public personage of a friend or a loved one. It is a meditative poem on the theme of human mortality. In classical literature, it covered a wide range of subjects from laments to love poems.

★ Pastoral elegy ⇒

It is a distinct type of elegy and follows a rather formal pattern. It represents its subject as an idealised shepherd in an idealised pastoral setting. It ends with an affirmative justification of nature's laws. Milton's 'Lycidas' (1638), Shelley's 'Adonais' (1821) and Arnold's 'Thyrsis' (1867) are some notable examples of pastoral elegy.

'Elegy Written in a Country Churchyard' is an outstanding example which pays.

Q.5 ⇒ What is a Dramatic Monologue?

Ans :⇒ Dramatic monologue is a kind of lyric poem in which there is a single speaker who is not poet. He utters the speech, in a specific situation at a critical moment. This person / speaker addre-ssed and interacts. 'My Last Duchess', who is addressing the envoy of a prospective father-in-law, confesses to the murder of the wife he is hoping to replace.

Q.6 ⇒ Write a brief note on the Free Verse?

Ans :⇒ Free verse, as the name suggests, is an free from of poetry. It does not have a regular meter or line length. Its rhymes are based on patterned elements such as sounds, words, phrases, sentences and paragraphs. Free verse, thus, eliminates much of the artificiality of poetic expression. Its flexible organisation suits the modern idiom and casual tonality of language.

Anju

Date :
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⇒ Anju

⇒ B.A. 2nd

⇒ 4th Sem.

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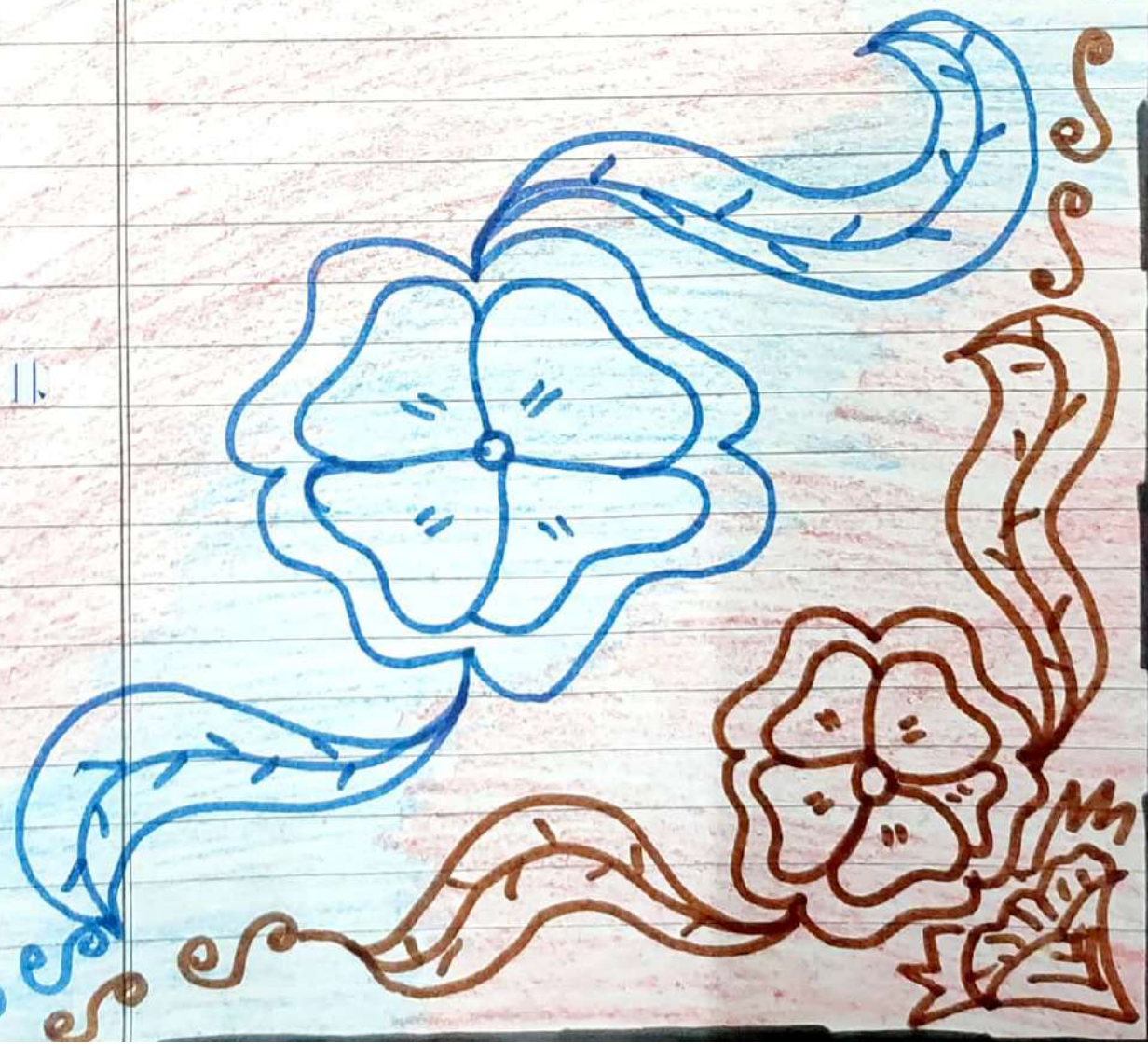

प्रश्न:- मानव भूगोल के परिभाषा दीजिए एवं इसके विषय क्षेत्र का विस्तृत वर्णन कीजिए ?

उत्तर:- मानव भूगोल का अर्थ :- भूगोल को मुख्य रूप से दो भागों में बाँटा गया है। भौतिक भूगोल का भी अर्थ इसी से निकलता है।

भूगोल के दो भाग :-

1) मानव भूगोल।

2) भौतिक भूगोल।

भौतिक भूगोल में पृथ्वी के प्राकृतिक परिस्थितियों का अध्ययन किया जाता है जबकि मानव भूगोल में हम मनुष्य तथा उसके वातावरण में होने वाली सभी प्रतिक्रियाओं तथा उनके अन्तर्सम्बन्धों का अध्ययन करेंगे। मानव भूगोल वह विज्ञान है जो दोनों के बीच पारस्परिक सम्बन्धों का अध्ययन क्षेत्रीय आधार पर किया जाता है।

मानव भूगोल के परिभाषा :-

रेटज़ेल :- मानव भूगोल के जन्मदाता फ्रेडरिक रेटज़ेल ने अपनी पुस्तक एन्थ्रोपोज्योग्राफी में मानव भूगोल

परिभाषाएं इस प्रकार दी गई हैं।

i) रेटजेल के अनुसार :- "मानव भूगोल भूपृष्ठ मानव समाजों तथा पृथ्वी तल के बीच सम्बन्धों का अध्ययन है।"

ii) रेटजेल के विचार को मार्श ने हेटनर के अनुसार :- "मानव भूगोल अधिकार पृथ्वी पर अनेक मानवों के पारस्परिक परिवर्तनशील सम्बन्धों का अध्ययन है।"

iii) हेटनर और हैटपसे के अनुसार :- "मानव भूगोल मनुष्य और उसके कार्यों का अध्ययन है।"

iv) फ्रांसीसी विद्वान जीन ब्रेस के अनुसार :- "मानव भूगोल उन सभी तथ्यों का अध्ययन है। जिसमें मानवी या क्रियाओं का कार्य कारण है जो हमारे पृथ्वी पर दर्शित होते हैं।"

⇒ मानव भूगोल का क्षेत्र :- मानव भूगोल के परिभाषा से पता चलता है कि मानव भूगोल का क्षेत्र बहुत अधिक विस्तृत है। इसके अध्ययन को चार भागों में भी विभाजित किया गया

1. जनसंख्या :- इसका वितरण, घनत्व, संसाधन, और जनसंख्या घनत्व में सम्बन्ध, वृद्धि के कारण।

2. मानव वृत्ति :- पर्यावरण, जीवों का वातावरण अनुकूलन, जीविका के साधन, मानवीय बस्तियाँ व सभ्यता का विकास है।

3. परिवहन एवं भूमंडल :- मानव और परिवहन के साधन, सड़के, रेल, महासागरीय परिवहन आदि।

4. मानव जातियाँ :- इनके अतिरिक्त मानव जातियाँ और नागरिकों का वर्णन करना मानव भूगोल का व्यापक क्षेत्र है।

प्रश्न 10 वन संसाधनों के भौगोलिक वितरण पर नोट लिखें?

उत्तर वन संसाधन प्रकृति की देन है जब इसके उगने, फलने फूलने में मनुष्य का कोई हाथ नहीं होता, तब उसे प्राकृतिक वनस्पति या वन संसाधन कहते हैं। वन एक महत्वपूर्ण जीविम संसाधन है। इसे 'हरा सोना' के संज्ञा दी जाती है। मानव अपनी आदिम अवस्था में वनों पर आश्रित था। आखेट तथा वनोत्पादों का संग्रहण इसका मुख्य व्यवसाय था। पर्यावरण को शुद्ध रखने, मिट्टी की नमी को बनाये, मिट्टी के उपजाऊ क्षमता बढ़ाने तथा जलवायु को नम बनाने में वनों का महत्व है। वन, लकड़ी, कागज, गोंद, लाख, औषधि, चमड़ा रंगने के वस्तुएँ तथा रबड़ आदि।

परन्तु मानव ने अपनी जरूरतों को पूरा करने के लिए इनकी अंधाधुंध कटाई करके इनको नष्ट कर दिया। इनकी सबसे बड़ी शताब्दी के शुरू में विश्व के 29% भाग पर वन संसाधन पाए जाते हैं। इनका वैश्विक वातावरण व वितरण इस प्रकार है।

1) वन संसाधनों का वितरण :- संसार में भी विभिन्न

प्रश्न 9 विश्व और द्वीपों के अनुसार :-

मानव
मंगोल के दल
को दो भागों में
बाँटा गया है।

2. प्राकृतिक तत्व :- इसमें जलवायु, भू-आकृतियाँ, जलीय साधन, प्राकृतिक वनस्पति, जन्तु, मिट्टियाँ व खनिज पदार्थों का अध्ययन है।

3. सांस्कृतिक तत्व अथवा मानव निर्मित पर्यावरण :- जनसंख्या घनत्व, वृद्धि, नर - मादी अनुपात, आयु वर्ग, ग्रामीण - नगरीय अनुपात तथा मानवीय बस्तियाँ सम्मिलित की जाती हैं।

ii) विभिन्न विद्वानों के आधार पर :-

1. किसी प्रदेश कि जनसंख्या व उसकी क्षमता।
2. प्राकृतिक वातावरण द्वारा दिए गए संसाधन।
3. जनसंख्या द्वारा प्राकृतिक साधनों के उपयोग से बना है।

1. विषुवतीय वन।
2. मानसूनी वन।
3. शीतोष्ण कटिबन्धीय चौड़ी पत्ती वाले सदाबहार वन।
4. शीतोष्ण कटिबन्धीय चौड़ी पत्ती वाले पतझड़ के वन।
5. कोणधारी वन।

→) वनों का वर्णन

1. विषुवतीय वन :- ये वन विषुवत्त रेखा के 5° उत्तरी तथा 5° दक्षिणी अंशासो के बीच पाए जाते हैं। अधिक ताप और आर्द्रता के कारण यहाँ पेड़-पौधों पर हरे भरे वर्ष हैं। इसमें वर्षा 200 से०मी० से अधिक होती है।

2. मानसूनी वन :- ये वन उष्ण कटिबन्धीय मानसूनी जलवायु वाले क्षेत्रों में पाए जाते हैं यहाँ पर वार्षिक

वर्षा 100 सेंटीमीटर से 200 सेंटीमीटर तक होती है। इस प्रकार के वन भारत-पाकिस्तान, म्यामार, श्रीलंका, आर्कटिक लाओस, मध्य अमेरिका, पूर्वी ब्राजील, आस्ट्रेलिया व अफ्रीका में पाया जाता है। इसमें चन्दन, देवदार, शीशम, सागवान, साल, महुआ, बाँस आदि।

5. शीतोष्ण कटिबन्धीय चौड़े पत्ती वाले सदाबहार वन :- ये वन महाद्वीपों के पश्चिमी भागों में 30° से 40° अंक्षाशों के बीच पाए जाते हैं। इसीलिए इन वनों को भूमध्य सागरीय वन भी कहते हैं। अन्य वनों की तुलना में ये वन मध्य चिलली, केप टाउन तथा दक्षिणी-पश्चिमी आस्ट्रेलिया में पाए जाते हैं।

6. शीतोष्ण पर्णपाती वन :- ये वन विश्व के उन क्षेत्रों में पाए जाते हैं जहाँ शीत ऋतु लम्बी व कठोर होती है। और ग्रीष्म ऋतु छोटी परन्तु अधिक वर्षा वाली होती है। इसलिए

उसमें कनाडा, नार्वे, स्वीडन, फिनलैण्ड, बाल्टिक, गणराज्य, सोवियत संघ, रूस, चीड़, फैल, हेमलाक, देवदार, फर, सिटका, ग्लास फर, ब्लूपाइन, लार्च तथा स्पेनिश आदि इनमें से कई वनों के रूप में महत्वपूर्ण हैं।

(II) वनों के लाभ :-

1. **प्रमुख पदार्थ** :- मानव प्राचीन समय में वनों के बीच में रहता था वन खाने के लिए इन्हीं पर निर्भर है।

2. **वस्त्र** :- कोणधारी वनों में मुलायम पेड़ों से हमें भरपूर रेशम से वस्त्र प्राप्त किए जाते हैं।

3. **कच्चा माल** :- वनों में बहुत से उद्योगों को कच्चा माल मिलता है जैसे कागज, दियासलाई, लाख, प्लाईवुड आदि।

4. **जड़ी-बूटियाँ** :- वनों से अनेक प्रकार की उपज है। जिस से विभिन्न प्रकार की दवाईयाँ बनाई जाती हैं।

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ASSIGNMENT

OF

GEOGRAPHY

Submitted to
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जनसंख्या दबाव का अर्थ :-

दुनिया के अधिकतर भागों में संसाधन कम और उनकी तुलना में जनसंख्या ज्यादा पाई जाती है। जनसंख्या और संसाधनों में असन्तुलन के फलस्वरूप अनेक प्रकार की विसंगतियों का जन्म होता है जिसे जनसंख्या दबाव कहा जाता है।

* Definitions of Population pressure :-

ट्यावर के अनुसार, "

जनसंख्या दबाव का तात्पर्य जनसंख्या के भारी दबाव के कारण जनसंख्या और संसाधनों के सन्तुलन का बिगड़ना है।"

ब्राउनिंग के अनुसार, "

जब किसी समुदाय के संसाधनों तथा जनसंख्या के बीच कुसंजन की स्थिति पैदा हो जाती है तो उसे जनसंख्या दबाव कहते हैं।"

निष्कर्ष के तौर पर कहा जा सकता है कि विश्व का कोई भी भू-भाग प्रौद्योगिकी के उपलब्ध

स्तर तथा वहाँ की आर्थिक, सामाजिक व सांस्कृतिक परिस्थितियों के सन्दर्भ में एक निश्चित जनसंख्या को ही पाल-पोस सकता है यदि जनसंख्या इससे अधिक हो जाती है तो जनसंख्या दबाव बढ़ने लगता है।

⇒ जनसंख्या दबाव के कारक और अवस्थाएँ -

किसी भी क्षेत्र में जनसंख्या के दबाव का संबंध वहाँ का आर्थिक, सामाजिक, सांस्कृतिक और ऐतिहासिक कारकों से होता है। क्योंकि ये कारक समय और स्थान के अनुसार बदलते रहते हैं। इसलिए जनसंख्या के दबाव की कोई भी सर्वमान्य परिभाषा अब तक नहीं आ सकी। शायद इसी कारण मोबागुंजे ने सुझाव दिया कि जनसंख्या दबाव तीन कारकों की पारस्परिक अंतः क्रिया का परिणाम है वे कारक हैं -(i) भूमि (संसाधन) (ii) जनसंख्या तथा लोगों की आकांक्षाएँ इन कारकों की तीन अवस्थाएँ पैदा होती हैं -

(1) जब जनसंख्या और संसाधन दोनों कम हों, पर लोगों की आकांक्षाएँ उच्च हों।

(2.) जब संसाधन कम हों, पर जनसंख्या व लोगों की आकाँक्षाएँ अधिक हों।

3) जब संसाधन और आकाँक्षाएँ दोनों कम हों पर जनसंख्या अधिक।

संसाधनों का शोषण :-

प्राचीन काल से में ही जनसंख्या कम थी और मानव की आवश्यकताएँ सीमित थी। वर्तमान युग में जनसंख्या तेजी से बढ़ रही है। लगभग 7 अरब तक पहुँच गई है। मनुष्य की आधारभूत आवश्यकताओं में वृद्धि के साथ मानव की उच्च स्तरीय जीवन जीने की लालसा भी बढ़ती जा रही है। माल्थस ने भी कहा है कि जीविकोपार्जन के साधन समान्तर श्रेढ़ी में बढ़ते हैं जबकि जनसंख्या गुणोत्तर श्रेढ़ी में बढ़ती है।
प्रमुख संसाधनों का विवरण इस प्रकार है।

(1) वन संसाधनों का उपयोग *
(2) खनिज संसाधनों का उपयोग *
(3) मृदा संसाधनों का प्रयोग *
(4) जल संसाधनों का प्रयोग *

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Q1. (a) Define the torsion rigidity of wire obtain an expression for torsional rigidity in l, γ and η. Also compare torque of solid with hallow cylinder.

(b) Why are hallow roads are used in constructing the cycle frame.

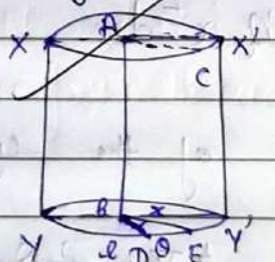
Q2. (a) Define Poissions Ratio (σ) and show that it is related with η and Y by the relation.

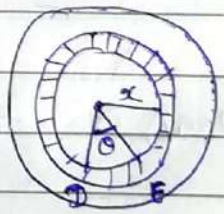
(b) State Hook's law and define related terms.

Solution.

Sol. 1. (a). Torsion rigidity of wire is the torque applied on wire for displacement of angle. on Cylinder.

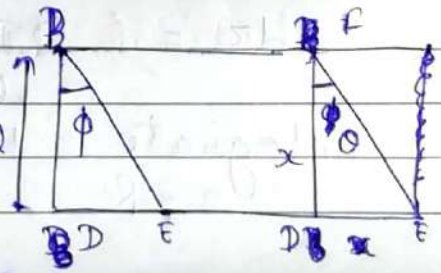
Consider a cylinder XX' diameter of circle and let the BD radius of cylinder be l. and then we rotate or displace the angle by appling some force then BE is x and angle form is θ.





cylinder with torision angle θ

Now, consider the angle $\angle DBE$ is ϕ and $\angle DBE$ is θ.



In $\triangle DBE$ we have.

$$\phi = \frac{DE}{BD}$$

$$\Rightarrow \quad DE = \phi l. \quad -(1)$$

Now, In $\Delta BDEF$

$$\theta = \frac{DE}{DF} \Rightarrow DE = \theta x \quad -(2)$$

Now, comparing eq (1) and (2) we get

$$\theta x = \phi l$$

$$\boxed{\phi = \frac{\theta x}{l}} \quad -(3)$$

Now, we know that modulus of rigidity

$$\eta = \frac{T}{\phi}$$

$$T = \eta\phi = \frac{\eta \theta x}{l} \quad -(4)$$

force = T × area of cylinder

$$= T \times 2\pi x\, dx \quad [\text{from } (4)]$$

$$= \frac{\eta \theta x}{l} 2\pi x\, dx$$

$$= \frac{2\pi\theta\eta}{l} x^2\, dx$$

Now, torque of the cylinder at small point.

$$d\tau = \frac{2\pi\eta x^2 \theta dx}{l} \cdot x$$

$$d\tau = \frac{2\pi\eta\theta x^3 dx}{l}$$

Now integrate taking limit $x = 0$ to $x = R$.

$$\int_0^R d\tau = \int_0^R \frac{2\pi\theta\eta}{l} x^3 dx$$

$$\tau = \frac{2\pi\eta\theta}{l} \int_0^R x^3 dx$$

$$\tau = \frac{2\pi\eta\theta}{l}\left[\frac{x^4}{4}\right]_0^R = \frac{2\pi\eta\theta[R^4 - 0]}{4l}$$

$$\tau = \frac{2\pi\eta\theta R^4}{4l} = \frac{\pi\theta\eta R^4}{2l}$$

$$\boxed{\tau = \frac{\pi\eta R^4\theta}{2l}}$$

Now, torque per unit angle.

$$C = \frac{\tau}{\theta} = \frac{\pi\eta R^4\theta}{2l\,\theta} = \frac{\pi\eta R^4}{2l}$$

$$\boxed{C = \frac{\pi\eta R^4}{2l}}$$

This is expression for torsional rigidity in l, R and η.

When we compare torque of solid cylinder with hollow cylinder.

Torque of hollow cylinder is more than torque of solid cylinder.

(b). Hollow roads are used in constructing the cycle frame because ~~their~~ ~~toq~~ torque of hallow(τ') cylinder is more ~~that~~ than torque of solid cylinder (τ)

i.e $\tau = \frac{\pi \eta R^4}{2l}$, $(\tau' > \tau)$.

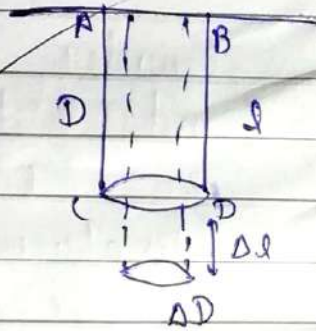
Sol. 2.

Poission Ratio :- (σ) - it defined as the ratio of lateral strain to longitudenal strain.

$$\sigma = \frac{\text{lateral strain}}{\text{longitudenal strain}} = \frac{\beta}{\alpha}$$

where = β = lateral strain per unit second.

α = longitudenal strain per unit second.



let us consider a cylinder ABCD. having length and dimension D. Then we apply deforming force then we have change in length Δl and change in dimension ΔD.

we know,

$\therefore$ lateral strain = $-\frac{\Delta D}{D}$

longitudenal strain = $\frac{\Delta l}{l}$

$\therefore \quad \sigma = -\frac{\Delta D \, l}{D \, \Delta l}$

Sol 2. (a) Relation between σ, η and Y.

we know that

$$\eta = \frac{1}{2(\alpha+\beta)} = \frac{1}{2\alpha(1+\frac{\beta}{\alpha})}$$

$$\eta = \frac{1}{2\alpha(1+\frac{\beta}{\alpha})} = \left[\because \frac{\beta}{\alpha} = \sigma\right]$$

$$\eta = \frac{1}{2\alpha(1+\sigma)}$$

$$2\eta = \frac{Y}{(1+\sigma)}$$

$$\boxed{Y = 2\eta(1+\sigma)}$$

Hence relation between Y, η and σ

Sol 2. (b) Hook's law.

It states that stress is directly proportional to the strain with in elastic limit. Extension is directly proportional to the load applied with in elastic limit.

i.e stress $\propto$ strain

stress = E strain

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Ques-1 (a) Define the torsion rigidity of wire. Obtain an expression for torsional rigidity in l, r and n. Also compare torque of solid with with hollow cylinder.

(b) Why are hollow roads are used in constructing the cycle frame.

Ques-2 (a) Define Poision's Ratio (σ) and show that it is related with n and Y by the relation.

(b) State Hook's law and define related terms.

Ques→3 (a) What do you mean by bending moment. Derive expression for it in a rectangular bar clamped at one end and loaded at other.

(b) What is Poission's ratio and what is its maximum and minimum values.

Ans→2 (a) Poission's Ratio (σ) =

Poission's Ratio is defined as the ratio of lateral strain per unit stress to the longitudinal strain per unit stress.

It is denoted by σ.

~~Maximum~~

$$\sigma = \frac{\beta}{\alpha}$$

β = lateral strain per unit stress

α = longitudinal strain per unit stress.

* Lateral strain :- It is defined as the ratio of change in diameter / radius to

original diameter / Radius.

$$\beta = -\frac{\Delta D}{D} = -\frac{\Delta r}{r}$$

-ve sign denotes the decrease in diameter or radius

*Longitidunal strain :- It is defined as the ration of change in length to original length.

$$\alpha = \frac{\Delta L}{L}$$

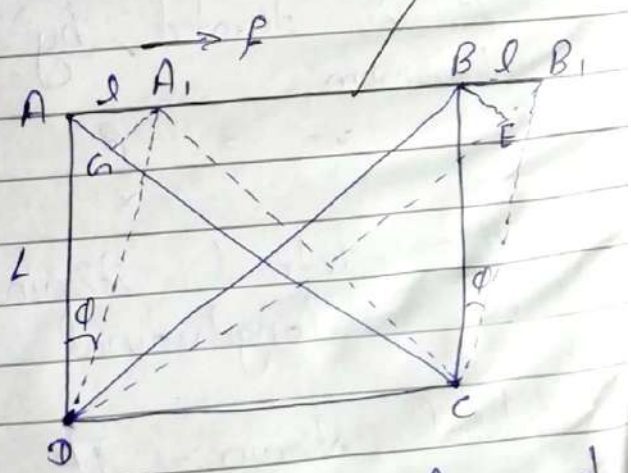
The maximum value of σ is $= \frac{1}{2}$

~~Proof :- let the volume of cylinder, $V = \pi r^2 h$~~

The values of Poission's ratio is -1 to 0.5
And experimently the value of Poission's ratio is 0.2 to 0.4.

Relation b/w η, ϕ and σ.

i) Relation b/w Shearing strain, extension strain, compression strain.



Let us consider a cube of side ABCD. Let L be the length of the cube. Now, the lower face of the cube is fixed and force applied on the upper end of the cube AB and the cube change the position A to A_1 and B to B_1.

Now cut an arc G at point A, and perpendicular to AG and are E at point B perpendicular to the point of DB_1. The diogonal DB of the cube extend at point. DB_1 and the diogonal AC compress at point A, C.

Now, ~~$\angle AA_1D = 90°$, $\angle AA_1G = 45°$~~

Now, $\angle BB_1C = 90°$, $\angle BB_1E = 45°$

$$EB_1 = BB_1 \cos 45° = \frac{BB_1}{\sqrt{2}} = \frac{l}{\sqrt{2}}$$

~~$BD =$~~

$$BD = \frac{BC}{\cos 45} = BC\sqrt{2} = L\sqrt{2}$$

Now, Extension of the cube is along DB,

$$DB = \frac{EB_1}{BD} = \frac{l}{\sqrt{2}} \times \frac{1}{L\sqrt{2}} = \frac{l}{2L} = \frac{1}{2}\phi$$

Now, $\angle AA_1D = 90°$, $\angle AA_1G = 45°$

$$AG = AA_1 \cos 45° = \frac{l}{\sqrt{2}}$$

$$AC = \frac{AD}{\cos 45} = L\sqrt{2}$$

Compression of the cube along AC

$$AC = \frac{l}{\sqrt{2}} \cdot \frac{1}{L\sqrt{2}} = \frac{l}{2L} = \frac{1}{2}\phi$$

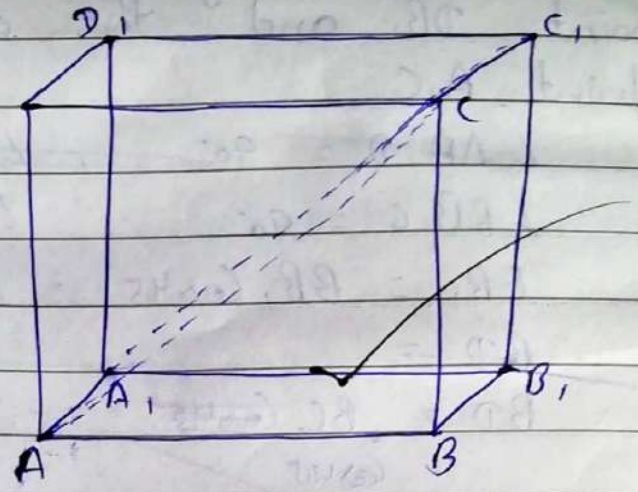
But we know that,

Shearing strain $= \tan\phi = \phi$

So, Shearing strain ϕ is equal to the sum of extension strain $\frac{1}{2}\phi$ and compression strain $\frac{1}{2}\phi$.

iii) Relation b/w shearing stress, compression stress and extension stress,

Let us consider a cube of ABCDA,B,C,D, of leng L. Now the lower end ABA,B, of the cube is fixed and force applied on the upper end DCD,C, of the cube. Then the cube shear by an angle Φ.



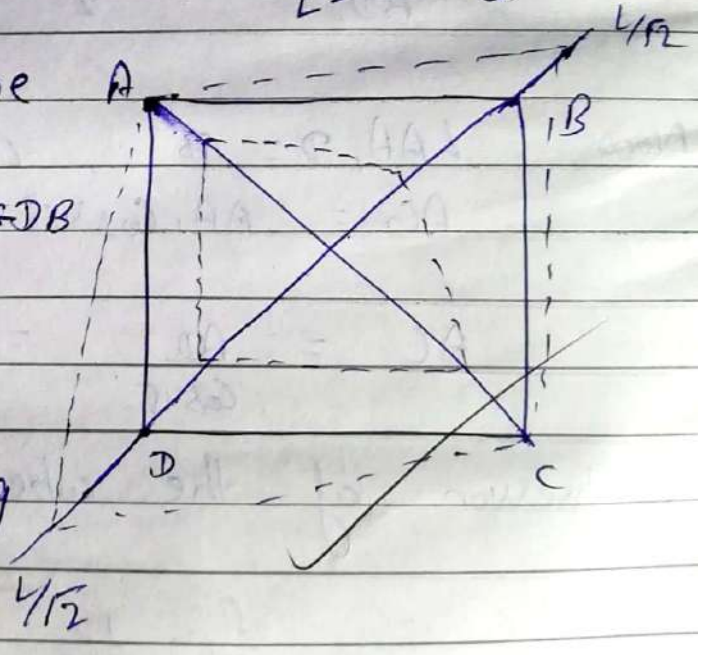
Shearing stress of the cube is = $\frac{F}{L^2} = \frac{F}{a} = T$

Now, the extension of the cube along DB,

$= \frac{F}{L^2} \times L\sqrt{2} \times DB = \frac{F}{L^2} \times L\sqrt{2} \times L\sqrt{2}$

$= F \times DB \times L = F \times L\sqrt{2} \times L =$

$\frac{F}{L^2} \times L^2\sqrt{2} = T$



Compression of the cube along AC,

$= \frac{F}{L^2} = T$

Shearing stress = T

So, the shearing stress, extension stress and compression stress is equal to each other.

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Relation b/w Y, n and σ

Now, the extension strain along DB due to extension stress :-

$DB = DB \times \beta \times T$

β = Lateral strain per unit stress.

Compression strain along DB AC due to extension stress :-

$DB = DB \times \alpha \times T$

Total extension, $DB = DB \times 2T(\alpha + \beta)$

Young ~~modulus~~ = $\frac{1}{2(\alpha+\beta)}$

$$n = \frac{1}{2(\alpha+\beta)} = \frac{1/\alpha}{2\left(1+\frac{\beta}{\alpha}\right)} = \frac{Y}{2(1+\sigma)}$$

$$Y = 2n(1+\sigma)$$

Hook's law :-

Within elastic limit, stress is directly proportional to the strain is known as Hook's law.

Stress $\propto$ strain

Stress = E strain

$E = \frac{\text{stress}}{\text{strain}}$

E be the modulus of elasticity or elasticity constant.

Terms Related to the Hook's law :-

i) Young Modulus :-

It is defined as the ratio of normal stress to the longitidunal strain. It is denoted by Y

$$Y = \frac{F}{a} \times \frac{L}{\Delta L}$$

Normal Stress = $\frac{F}{a}$, Longitidunal Strain = $\frac{\Delta L}{L}$

ii) Bulk Modulus :-

It is defined as the ratio of normal stress to the volumetric strain. It is denoted by K,

$$K = \frac{F}{a} \times \frac{V}{\Delta V} = \frac{PV}{\Delta V}$$

P be the pressure.

iii) Modulus of Rigidity :-

It is defined as the ~~change in length~~ normal stress to the longitidunal strain.

$$\eta = \frac{F}{} \tan\phi = \phi$$

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Ans 3 (b) Poissions Ratio :- It is defined as the ratio of lateral strain to the longitudinal strain.

$$\sigma = \frac{\beta}{\alpha}$$

β = lateral strain per unit stress
α = longitudinal strain per unit stress.

The value of poission's ratio is :-

$$3K(1-2\sigma) = 2n(1+\sigma)$$

The value of poission's ratio is +ve or -ve when the σ value is +ve,

$$1-2\sigma > 0$$
$$2\sigma < 1$$
$$\sigma < \frac{1}{2}$$
$$\sigma < 0.5$$

When the value is -ve,

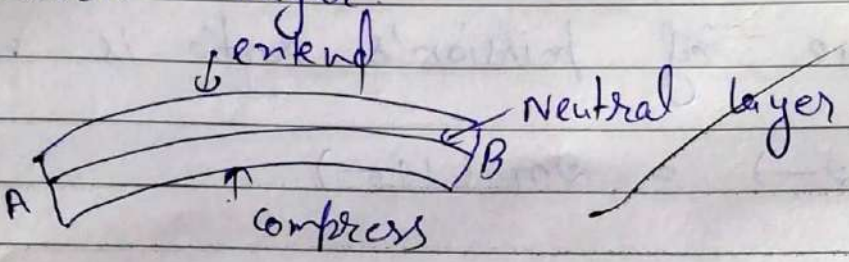
$$1+\sigma > 0$$
$$\sigma > -1$$

Ans (a) Bending of beam :-

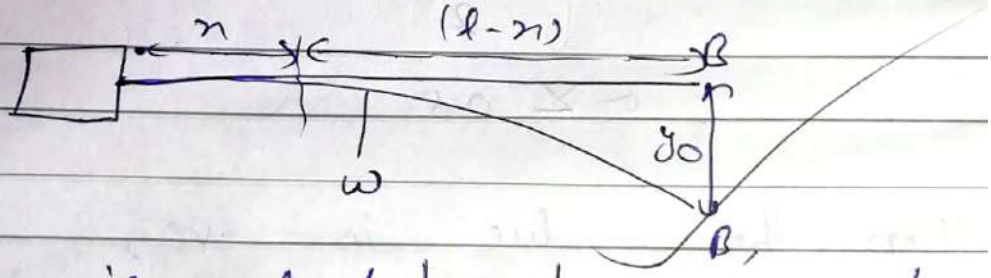
A beam is a recangular or circular cross-sectional shaped. Its length is greater than its breadth. So the angle of shearing is negilibisal small.

A beam is horizonatally placed. It is used for heavy load.

When the load is applied on the beam the the inner layer get compressed and the outer layer is extend. A layer present in b/w the upper and lower layer. There is no effect on the this layer is known as neutral layer.



Expression for it in a recangelar bar clamped at one end and loaded at other)-



When a beam is clamped at one end and loaded at other end is known as centiliver.

Consider a beam AB of length l. When the load is applied on the beam and neglected the weight of the beam then the moment of beam is, $G_x = w(l-x)$

Nisha

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1. a) Define the torsion rigidity of wire. obtain an expression for torsional rigidity in l, r and n. also Compare torque of solid with hollow cylinder.

b) why are hollow roads are used in Constructing the cycle frame.

2. a) Define poission's Ratio (σ) and show that it is related with n and Y by the relation

b) State Hooke's law and define related terms.

3. a) what do you mean by bending moment. Drive expression for it in a rectangular bar clamped at one end and loaded at other.

b) what is poission's ratio and what is its max & min values.

---

2. a) Poission's Ratio :-

It is define as the ratio of lateral strain to longitudinal strain is called Poission's Ratio.

It is denoted by σ.

$$\sigma = \frac{\text{lateral strain}}{\text{longitudinal strain}}$$

and lateral strain is denoted by symbol β and longitudinal strain is denoted by symbol α.

$$\sigma = \frac{\beta}{\alpha} \longrightarrow (i)$$

lateral strain is change in diameter to the original diameter.

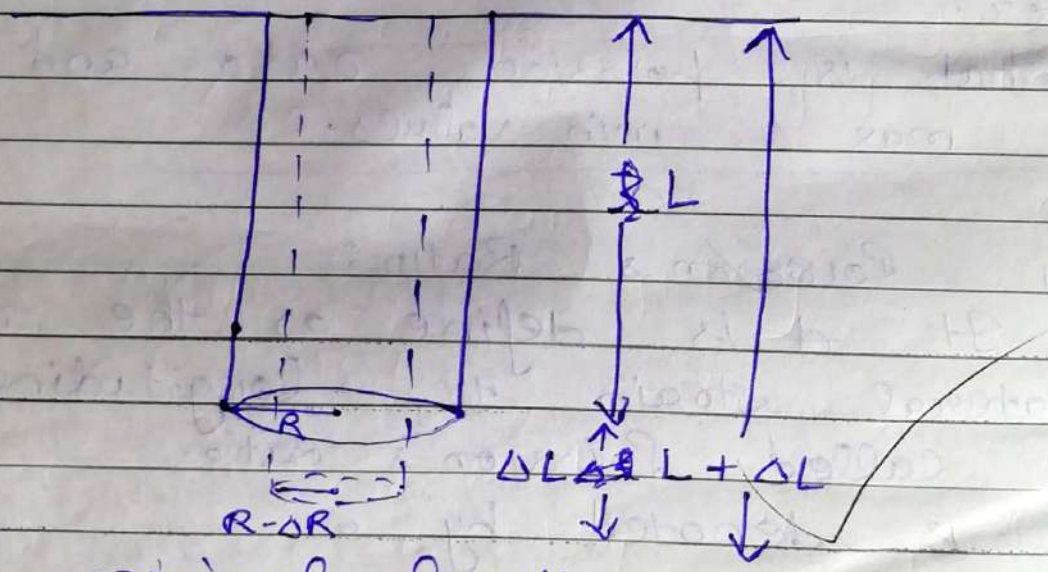
$$\text{lateral strain} = \frac{\Delta D}{D} = \beta \rightarrow (2)$$

Longitudinal strain is ratio of change in length to the original length.

$$\text{longitudinal strain} = \frac{\Delta L}{L} = \alpha \rightarrow (3)$$

Putting the value of α & β in eqn (1)

$$\sigma = \frac{\Delta D \times L}{D \times \Delta L} \rightarrow (4)$$



L = original length
ΔL = change in length
R = original radius
ΔR = change in radius.

Consider a cylindrical bar of uniform area of cross-section. when force is applied, there will be increase in length and decrease in diameter of the cylinder

we know that

$$D = \frac{R}{2}$$

So equ (4) become

$$\sigma = \frac{\Delta R \times 2 \times L}{2 \times R \times \Delta L}$$

$$\boxed{\sigma = \frac{\Delta R L}{R \Delta L}}$$

⇒ Relation b/w σ, η & γ

we know that

$$\eta = \frac{1}{2(\alpha + \beta)}$$

$$= \frac{1/\alpha}{2(1 + \beta/\alpha)} \rightarrow (1)$$

we know

$$\frac{1}{\alpha} = \gamma \quad \text{and} \quad \frac{\beta}{\alpha} = \sigma$$

Putting these value in equ (1)

$$\eta = \frac{\gamma}{2(1+\sigma)}$$

$$\boxed{2\eta(1+\sigma) = \gamma}$$

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2) Hooke's law :-

In 1679, Hooke's establish a law which define that strain is directly proportional to the stress.

i.e strain $\propto$ stress

$$\frac{\text{stress}}{\text{strain}} = E \text{ (constant)}$$

$$\text{stress} = \frac{\text{Force}}{\text{Area}}$$

$$\text{strain} = \frac{\text{change in configuration}}{\text{orginal configuration}}$$

where E (constant) is called elasticity of rigidity.

This law also explain.
Force or load applied on a wire is directly proportional to the length of the wire.

$$F \propto l$$

3 a) Bending of beam :-

3 b) Poission's ratio :- It is define as the ratio of lateral strain to the longitudinal strain.

3

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1. State transport of energy. Establish the Relⁿ b/w thermal conductivity of a gas K, coefficient of viscosity of a gas η and specific heat of that gas under constant value C_v.

2. State the basic postulates of special theory of Relativity and deduce Lorentz transformations.

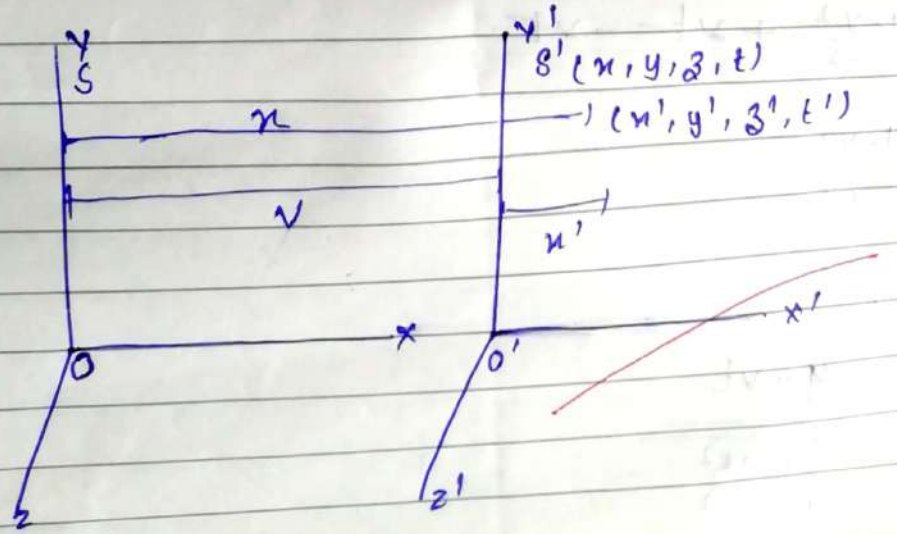
Ans:- 1. First postulate are the law of physics are invariant in all inertial frame of reference. i.e the fundamental law of physical phenomenon are the frame of refrence in the constant velocity with respect to each other

2

(ii) Second postaulates is that speed of light in vaccum or free space is same in all direction and independent of motion of the source i.e. the velocity of light is invarient.

(iii) The speed of light and have some value of the inertial frame.

Lorentz transformations :-



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x, y, z be the three rectangular components and x', y', z' be the three rectangular components of o's. v be the velocity and x is the distance b/w them.

$t = 0$

$x' = x - vt$

$y' = y$

$z' = z$, $t = 0$

$x' = x - vt$ ——— (1)

differentiation w.r.t t

$$\frac{dx'}{dt} = \frac{dx}{dt} - v$$

Again differentiation w.r.t t

$$\frac{dx'^2}{dt^2} = \frac{dx^2}{dt^2} - 0$$

$$u_1 = \frac{x - vt}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$u_1\sqrt{1 - \frac{v^2}{c^2}} + vt = x$$

~~Putting~~ x = Putting the value of x in eq. (1)

$$x' = u_1\sqrt{1 - \frac{v^2}{c^2}} + vt - vt.$$

$$x' = u_1\sqrt{1 - \frac{v^2}{c^2}}$$

Similarly,

$$u_2 = \frac{y - vt}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$u_2\sqrt{1-\frac{v^2}{c^2}} + vt = y$

Putting the value of y in eq. (1)

$y' = y$

$y' = u_2\sqrt{1-\frac{v^2}{c^2}} + vt$

Similarly,

$z' = z$

$z' = u\sqrt{1-\frac{v^2}{c^2}} + vt$

$x' = u_1\sqrt{1-\frac{v^2}{c^2}}$

$y' = u_2\sqrt{1-\frac{v^2}{c^2}} + vt$

$z' = u\sqrt{1-\frac{v^2}{c^2}} + vt$

$t = 0$

Monika
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1. MB Statistics for energy distribution
2. Derive an expression for most probable distribution and statistical fluctuations.
3. Define phase space and size of phase space cell.

2. Ans = Most probable distribution and statistical fluctuations :-

$$P(r, n-r) = \frac{n C_r}{2^n}$$

$$P(r, n-r) = \frac{n!}{r!(n-r)!} \times \frac{1}{2^n}$$

P_{max}, $r = \frac{n}{2}$

$P_{max} = \left(\frac{n}{2}, \frac{n}{2}\right)$

$$P_m = \frac{n!}{\frac{n}{2}! \frac{n}{2}!} \times \frac{1}{2^n} = \frac{n!}{\left(\frac{n}{2}!\right)^2} \times \frac{1}{2^n}$$

$$P_n = \left(\frac{n}{2} + n, \frac{n}{2} - n\right)$$

$$P_n = \frac{n!}{\left(\frac{n}{2}+n\right)! \left(\frac{n}{2}-n\right)!} \times \frac{1}{2^n}$$

Multiply and divided ~~both~~ by $\left(\frac{n}{2}!\right)^2$

$$P_n = \frac{n!}{\left(\frac{n}{2}!\right)^2} \times \frac{1}{2^n} \times \frac{\left(\frac{n}{2}!\right)^2}{\left(\frac{n}{2}+n\right)!\left(\frac{n}{2}-n\right)!}$$

$$P_n = P_m \times \frac{\left(\frac{n}{2}!\right)^2}{\left(\frac{n}{2}+n\right)!\left(\frac{n}{2}-n\right)!}$$

Taking logarithms on both sides

$$\log P_n = \log P_m + 2\log\left(\frac{n}{2}!\right) - \log\left(\frac{n}{2}+n\right)! - \log\left(\frac{n}{2}-n\right)!$$

Applying stirling formula,

$$\log P_n = \ln P_m + 2\left[\frac{n}{2}\log\frac{n}{2} - \frac{n}{2}\right] - \left[\left(\frac{n}{2}+n\right)\ln\left(\frac{n}{2}+n\right) - \left(\frac{n}{2}+n\right)\right] - \left[\left(\frac{n}{2}-n\right)\ln\left(\frac{n}{2}-n\right) - \left(\frac{n}{2}-n\right)\right]$$

$$\ln P_n = \ln P_m + n\ln\frac{n}{2} - n - \left[\ln\left(\frac{n}{2}+n\right) + \left(\frac{n}{2}-n\right)\right] - \left[\left(\frac{n}{2}+n\right)\ln\left(\frac{n}{2}+n\right) - \left(\frac{n}{2}-n\right)\ln\left(\frac{n}{2}-n\right)\right]$$

$$\ln P_n = \ln P_m + n\ln\frac{n}{2} - n + n - \left[\left(\frac{n}{2}+n\right)\ln\left(\frac{n}{2}+n\right) - \left(\frac{n}{2}-n\right)\ln\left(\frac{n}{2}-n\right)\right]$$

$$\ln P_n = \ln P_m + n\log\frac{n}{2} - \left[\left(\frac{n}{2}+n\right)\ln\left(\frac{n}{2}+n\right) - \left(\frac{n}{2}-n\right)\ln\left(\frac{n}{2}-n\right)\right]$$

$$\ln\left(\frac{n}{2}+x\right) = \ln\left[\frac{n}{2}\left(1+\frac{2x}{n}\right)\right]$$

$$= \ln\frac{n}{2} + \ln\frac{n}{2}\left(\frac{2x}{n}\right)$$

$$= \ln\frac{n}{2} + \left(\frac{2x}{n}\right) - \left(\frac{2x}{n}\right)^2 \times \frac{1}{2} + \cdots$$

similarly

$$\ln\left(\frac{n}{2}-x\right) = \ln\left[\frac{n}{2}\left(1-\frac{2x}{n}\right)\right]$$

$$= \ln\frac{n}{2} - \ln\frac{n}{2}\left(\frac{2x}{n}\right)$$

$$= \ln\frac{n}{2} - \left(\frac{2x}{n}\right) - \left(\frac{2x}{n}\right)^2 \times \frac{1}{2} + \cdots$$

Putting these values in above eqn:-

$$\ln P_n = \ln P_m + n\log\frac{n}{2} - \left[\ln\frac{n}{2} + \left(\frac{2x}{n}\right) - \left(\frac{2x}{n}\right)^2 \times \frac{1}{2}\right]\left(\frac{n}{2}+x\right) - \left[\left(\frac{n}{2}-x\right)\left(\ln\frac{n}{2} - \left(\frac{2x}{n}\right) - \left(\frac{2x}{n}\right) \times \frac{1}{2}\right)\right.$$

$$\ln P_n = \ln P_m + n\log\frac{n}{2} - \frac{n}{2}\left[\ln\frac{n}{2} + \left(\frac{2x}{n}\right) - \left(\frac{2x}{n}\right)^2 \times \frac{1}{2} + \ln\frac{n}{2} - \left(\frac{2x}{n}\right) - \left(\frac{2x}{n}\right)^2 \times \frac{1}{2}\right] -$$

$$x\left[\ln\frac{n}{2} - \left(\frac{2x}{n}\right) + \left(\frac{2x}{n}\right)^2 \times \frac{1}{2} + \ln\frac{n}{2} - \left(\frac{2x}{n}\right) + \left(\frac{2x}{n}\right)^2 \times \frac{1}{2}\right]$$

Que-1.

Ans = MB Statistics for energy distribution -

$(n_1, n_2, n_3 - - - n_k)$ be the number of phase space cells with energy $(u_1, u_2 - - u_k)$

$$n = \sum_{i=1}^{k} n_i$$

$$dn = \sum_{i=1}^{k} dn_i \quad \text{---} (1)$$

$$(n_1 u_1, n_2 u_2, - - - n_k u_k) = \sum_{i=1}^{k} n_i u_i$$

$$= \sum_{i=1}^{k} d(u_i n_i)$$

$$= \sum_{i=1}^{k} dn_i u_i \quad \text{---} (2)$$

multiply eqn (1) by α and (2) by β

$$\alpha \sum_{i=1}^{k} dn_i + \beta \sum_{i=1}^{k} dn_i u_i$$

$(g_1, g_2 - g_k)$ be the phase no. of cells

then $$\prod_{i=1}^{k} \left(\frac{g_i}{n_i}\right)^{n_k}$$

Taking log

$$= \sum_{i=1}^{k} \ln(g_i)^{n_k} - \sum_{i=1}^{k} \ln n_i$$

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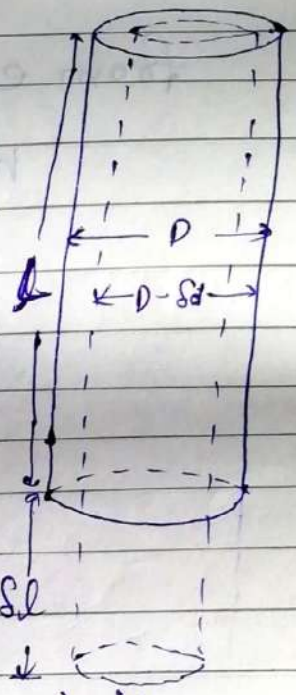
2. (a).

Poission Ratio ⇒

With in elascity, The ratio of lateral strain ~~strain~~ to logitudnal strain, is called Poission Ratio. its denoted by σ

$$\sigma = \frac{\beta}{\alpha}$$

Consider ~~cross~~ a cylinder cross-section area a and length l, ~~Radius~~ change in length δl



$$= \frac{F}{a} \times \frac{\delta l}{L}$$

=

Show that is related with η and Y

$$Y = \frac{1}{\quad}$$

Y is the Young modulus. this isotropic is value already show. η is bulk modulus

$$Y = \frac{1}{3(\alpha + 2\beta)} \frac{1}{\alpha} \quad -(1)$$

$$\eta = \frac{1}{2(\alpha+\beta)} \quad -(2)$$

relation with Y from eq. (1)

$$Y = \frac{1}{3(\alpha - 2\beta)} \times \frac{1}{3\alpha\left(1 - 2\frac{\beta}{\alpha}\right)}$$

$$= \frac{1}{\alpha}$$

relation b/w Y and η

$$Y = \frac{1}{\alpha} \quad -(1)$$

$$\eta = \frac{1}{2(\alpha+\beta)} \quad -(2)$$

from eq. (2) .. we have

$$\eta = \frac{1}{2\alpha\left(1+\frac{\beta}{\alpha}\right)}$$

$$\eta = \frac{\frac{1}{\alpha}}{2(1+\sigma)} \qquad \eta = \frac{Y}{2(1+\sigma)}$$

$$2\eta = \frac{Y}{(1+\sigma)}$$

$$2\eta(1+\sigma) = Y$$

$$Y = 2\eta(1+\sigma) \quad -(3)$$

its three elastic Constant.

(b) Hookes law.

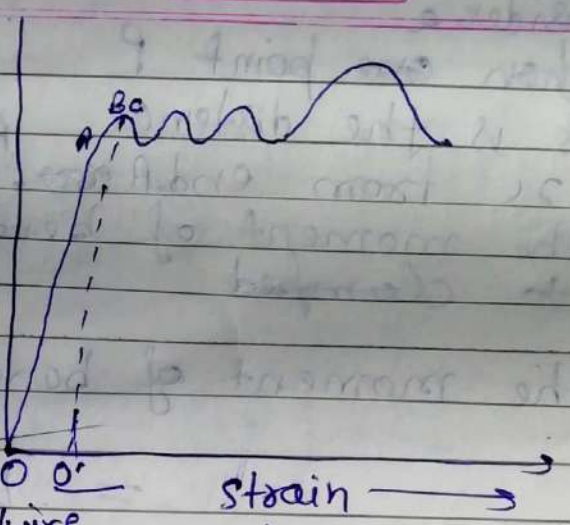
In 1987 Robert estblished fundamental experiment is know as hookes law.

The strain produced is directly prop to stress, provided stress is small We shown graph b/w stress & strain

within elastic the ratio of stress to strain is Constant.

When increase the value of stress then corresponding to increase value of strain

When till reached, the rapidly increase the stress value increase AO point value increase but BO' point value decrease.



by Hookes law,

Consider a ~~thin~~ rod/wire Cross section area a and Change in length l.

According Hookes law

$$= \frac{F}{a} \times \frac{l}{L}$$

where L is the length of wire. a & L is the Constant.

with in elastic, the extension produce of wire is directly proportional to load, provided small the load.

(3)(a)

rod Consider a thin uniformally clamped horizonatally to one end and another other end is load is called Centilever A is the one end & B is the loded end.

When B end loaded in the load B, W is the weight of loaded in the load end. l is the length of wire.

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Section A.

Ans = 3

(a) Bending moment of a beam :-

Bending moment is the moment at which a beam bends when some load is took on it.

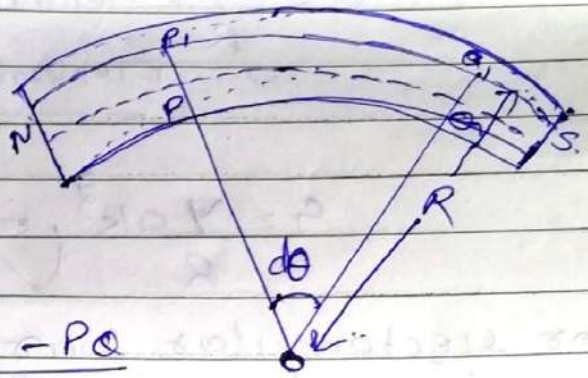
To derive the expression for bending of beam in a rectangular bar clamped at one end and loaded at the other :-

We consider a rectangular bar of uniform area of cross-section.

$PQ = R d\theta$

When PQ increases at P_1Q_1,

$P_1Q_1 = (R+z)d\theta$



Increase in length

$(R+z)\,d\theta - R\,d\theta = z\,d\theta$

longitudinal strain $= \frac{P_1Q_1 - PQ}{PQ}$

$= \frac{z\,d\theta}{R\,d\theta} = \frac{z}{R}$

Young's modulus $Y = \frac{\text{stress}}{\text{strain}}$

Stress = Y x strain

stress $= Y \times \frac{z}{R}$

Force $F = \delta a \times \frac{Yz}{R}$

Moment of force about line M_1M_2.

$F \times z = \left(\delta a \times \frac{Yz}{R}\right) \times z = \frac{Y \delta a z^2}{R}$

$\frac{Y}{R}(\delta a)z^2$ called bending moment which is equal and opposite to the external torque.

$$G = \frac{Y}{R} \Sigma (\delta a) z^2 \Rightarrow \frac{Y}{R} I_g$$

$$G = \frac{Y I_g}{R}$$

let $\Sigma(\delta a) z^2 = a k^2$.

where k is radius of Gyration.

$$G = \frac{Y}{R} a k^2$$

$Y a k^2$ is flexural rigidity.

$G = \frac{Y}{R} \times$ Geomatrical moment of Inertia.

$\Rightarrow$ Flexural rigidity / R.

$$G = \frac{Y a k^2}{R} = \frac{Y}{R} \times \frac{b d^3}{12}$$

for rectangular bar $a k^2 = \frac{b d^3}{12}$.

$$G = \frac{Y b d^3}{12 R}$$

(b) Poisson ration :-

$$\sigma = \frac{\beta}{\alpha} = \frac{\text{letral Contraction}}{\text{longitudinal extension}}$$

$$3K(1 - 2\sigma) = 2\eta(1 + \sigma)$$

for this equation.

If we take σ positive on right hand side it will also positive on that of left hand side then $1 - 2\sigma > 0$ or

$$2\sigma < 1$$

$$\sigma < \frac{1}{2} \quad \text{or} \quad \sigma < 0.5$$

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Class Roll no - 12 Section A

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Que=1 (a) Define torsion rigidity of wire obtain an expression for torsional rigidity in l, r and n also compare torque of solid with hollow cylinder.

(b) why are the hollow rods used in constructing cycle frame

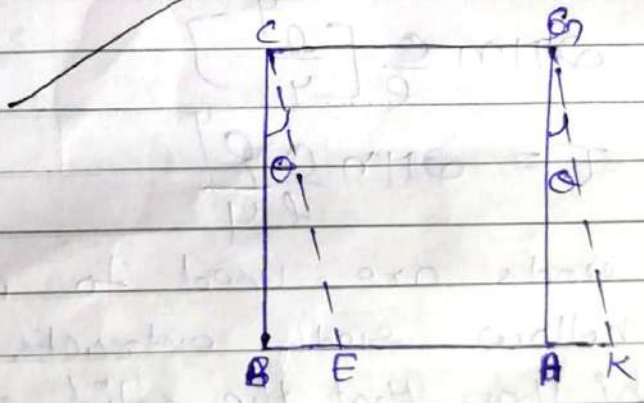
Que=2 (a) Define Poisson's ratio show relation with m and Y by relation.

b) state Hookes law and define related terms.

Que=3 (a) Bending moment of beam. Drive expression for a rectangular bar clamped at one end and loaded at other end.

(b) what is Poisson's ratio what it's maximum and minimum value.

Ans=1 Torrosion or torque of a hollow cylinder :-



$$l\phi = r\theta$$

$$\phi = \frac{r\theta}{l}$$

as $n = \frac{T}{\phi}$ $\quad n\phi = T$ ——①

Putting the value of ϕ in eq ①.

$$T = n\frac{r\theta}{l}$$

Area of the cylinder $= \pi(r+dr)^2 - \pi r^2$.

$= 2\pi r\, dr$.

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F = tangential stress x area.

$F = \eta \frac{x\theta}{l} \times 2\pi x\,dx.$

$F = 2\pi\eta \frac{\theta}{l} x^2\,dx.$ [As moment = F x]

As moment = F x l_x.

$F = 2\pi\eta \frac{\theta}{l} x^2\,dx \times x$

$\Rightarrow 2\pi\eta \frac{\theta}{l} x^3\,dx.$

on integrating we have.

$$\int_0^\tau d\tau = \int_0^l 2\pi\eta \frac{\theta}{l} x^3\,dx$$

$$\tau = 2\pi\eta \frac{\theta}{l} \left[\frac{x^4}{4}\right]_0^l$$

$$\tau = 2\pi\eta \frac{\theta}{l} \left[\frac{l^4}{4}\right]$$

$$\tau = 2\pi\eta \frac{\theta}{l} \frac{l^4}{4}$$

(b) Holloco rods are used to made cycle frames because holloco rods extracts a greater torque than that the solid rod. This torque helps to main this shape and size for a long time. so holloco rods are used to made cycle frames and not solid rods

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Ans = (a) Poisson's Ratio :- It is the ratio of letral contraction and the longitudinal ~~strain~~ extension. It is represented by σ.

$$\sigma = \frac{\beta}{\alpha} = \frac{\text{lateral contraction}}{\text{longitudinal extension}}$$

Relation between Poisson's ratio σ, η and Young's modulus Y :-

$$\sigma = \frac{\beta}{\alpha}$$

DB due to extension.
$\rightarrow DB \times \alpha \times T$.
DB due to contraction
$= DB \times \beta \times T$.
Total extension $= DB \times T \times (\alpha + \beta)$.

$DB = B_1 E = \frac{l}{L_2}$

where l is displacement in direction of force

$$L_2 \times T(\alpha+\beta) = \frac{l}{L_2} \quad (\because DB = L_2)$$

$$T = \frac{\frac{l}{L}}{2(\alpha+\beta)} = \frac{\phi}{2(\alpha+\beta)}$$

$$\eta = \frac{T}{\phi} = \frac{1}{2(\alpha+\beta)} \quad \text{---} (1)$$

on dividing Right hand side of equation (1) by α.

$$\eta \Rightarrow \frac{\frac{1}{\alpha}}{2\left(\frac{\alpha}{\alpha}+\frac{\beta}{\alpha}\right)} \Rightarrow \frac{Y}{2(1+\sigma)}$$

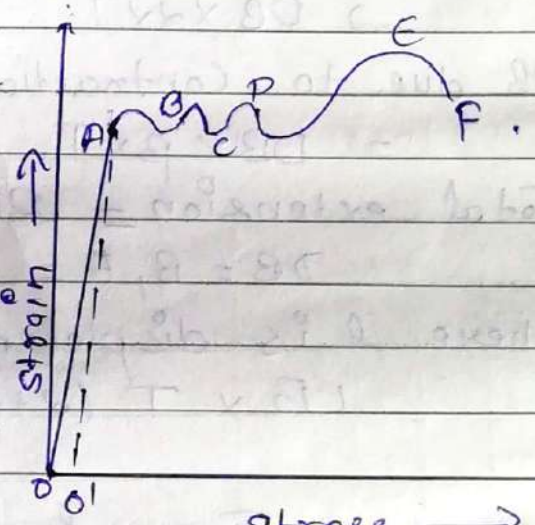
$$Y = 2\eta(1+\sigma).$$

Hence is the required relation between Y, η and σ.

(b) Hooke's law:-

In 1679, Robert Hooke explained experimentally the law of elasticity. It stated under as:

The strain produced is directly proportional to the stress, provided strain is small i.e. the ratio of stress to strain will be constant which is called modulus of elasticity. The stain is just the pressure and stress is constant. If we plot a graph between strain and stress we see that. If we increases the value of strain stress also increases. At some point value of stress increases more rapidly than that given by Hookes law. At that point Hooke's law does not aplicable. The stress beyond which the Hookes law is not applicable is called elastic limit of that material.



$$\frac{F}{a} \times \frac{l}{L} \quad (\text{strain})$$

Here F is Force a is area of cross section
l is the length of cross-section.
L is total length of the wire.

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Q-1 (a) Define the torsion rigidity of wire. Obtain an expression for torsional rigidity in l, r an η Also compare torque of solid with hollow cylinder.

(b) Why hollow roads are used in constructing the cycle frame.

Q-2 (a) Define poission's ratio and show that it is related with η and Y by the relation.

(b) State Hook's law and define related term

Q-3 (a) What do you mean by bending moment. Derive expression for it in a rectangular bar clamped at one end and loaded at other.

(b) What is Poission's ratio and what is its maxi and minimum values.

2. (b) Hook's Law →

With in an elastic limit strain is directly proportional to stress.

$$\text{Strain} \propto \text{Stress}$$

or $$\text{Stress} \propto \text{Strain}$$

$$\text{Stress} = E \times \text{Strain}$$

$$E = \frac{\text{Stress}}{\text{Strain}}$$

where E = modulus of elasticity.

* The terms related to modulus of elasticity are –

1. Young Modulus (Y) →
It is defined as the ratio of normal stress to longitudinal strain.

$$Y = \frac{\text{Normal stress}}{\text{Longitudnal strain}}$$

$$Y = \frac{FL}{A\Delta L}$$

where F = force applied
A = Area
L = original length
ΔL = change in length

2. Bulk Modulus (K) →
It is defined as the volumetric strain per unit normal stress.

$$K = \frac{\text{Normal stress}}{\text{Volumetric strain}}$$

$$K = \frac{FV}{A\Delta V}$$

$$K = \frac{PV}{\Delta V} \quad \left[\because \frac{F}{A} = P\right]$$

Compressiblity $k = \frac{1}{K} = \frac{\Delta V}{PV}$

Modulus of Rigidity (η) :-
It is defined as the shear strain per unit tangential stress.

$$\eta = \frac{\text{Tangential stress}}{\text{Shear strain}} = \frac{T}{\phi}$$

$$\eta = \frac{f\phi}{A\Delta\phi}$$

2 (a) Poission's Ratio →

It is the ratio of lateral strain to longitudnal strain.

It is denoted by σ.

Lateral strain is the change in the diameter to original diameter.

It is denoted by β.

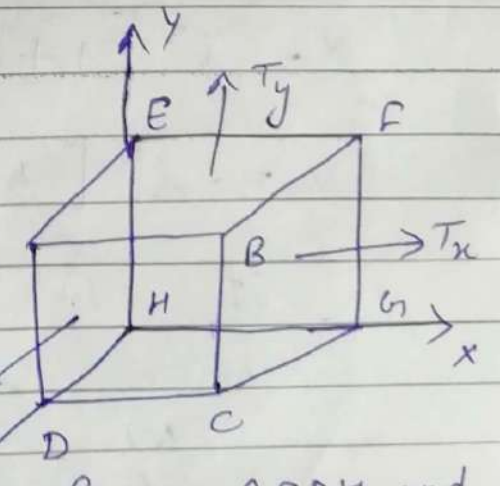
$$\sigma = \frac{\beta}{\alpha} \cdot \frac{\text{Lateral strain}}{\text{Longitudnal strain}}$$

$$\alpha = \frac{\Delta L}{L} \qquad \beta = \frac{\Delta D}{D}$$

$$\sigma = \frac{\Delta D L}{D \Delta L}$$

or $$\sigma = \frac{\Delta r L}{r \Delta L}$$

Relation b/w σ, η & Y



Consider a cube ABCDEFGH having each side of length l. The various forces are applied. The applied tension T_x is parallel to x-axis and ⊥ar to two faces AEDH and BFGC. Similarly T_y is parallel to y-axis and ⊥ar to AEBF and CDHG. Tension T_z is parrallel to z-axis and ⊥ar to EHGF and ABCD

The force applied will produce elongation in applied direction and contraction in other direction. Let α is the increase in length per unit area per unit stress i.e longitudnal strain and β is the contraction in other direction i.e lateral strain. The elongation in x-axis is $l\alpha T_x$ a contraction is $l\beta T_x$.

for T_x Length of side of cube,

$$HG = l + l\alpha T_x = l(1+\alpha T_x)$$
$$HE = l + l\beta T_y = l(1-\beta T_y)$$
$$HD = l + l\beta T_z = l(1-\beta T_z)$$

Similarly for T_y and T_2

Now final length

$$HG = l(1+\alpha T_x - \beta T_y - \beta T_z)$$
$$HE = l(1+\alpha T_y - \beta T_x - \beta T_z)$$
$$HD = l(1+\alpha T_z - \beta T_x - \beta T_y)$$

Volume of cube = $HG \times HE \times HD$

$$= l^3(1+\alpha T_x - \beta T_y - \beta T_z)(1+\alpha T_y - \beta T_x - \beta$$
$$(1+\alpha T_z - \beta T_x$$

$$V = l^3\left[1+\alpha(T_x+T_y+T_z) - 2\beta(T_x+T_y+T_z)\right]$$

$$V = l^3\left[1+(\alpha-2\beta)(T_x+T_y+T_z)\right]$$

if $T_x = T_y = T_z = T$

$$V = l^3[1+3T(\alpha-2\beta)]$$

$$\frac{\Delta V}{} = l^3[1+3(\alpha-2\beta)T] - l^3$$

$$\Delta V = 3(\alpha-2\beta)Tl^3$$

volumetric strain $= \frac{\Delta V}{V} = 3(\alpha-2\beta)$

Roll No. - 14

2 (a) Bulk modulus $K = \frac{1}{3(\alpha - 2\beta)}$

$$K = \frac{1/\alpha}{3\left(1 - 2\frac{\beta}{\alpha}\right)}$$

$\frac{1}{\alpha} = Y$ $\quad \frac{\beta}{\alpha} = \sigma$

$$K = \frac{Y}{3(1-2\sigma)}$$

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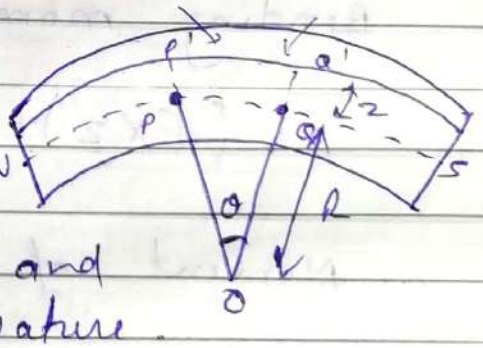
$$\eta = \frac{1}{2(\alpha+\beta)}$$

3 (a) Bending Moment →

The thin road having large length in compression to thickness form an arc known as bending moment

Consider a road having PQ as an arc. The neutral axis NS has equal length The arc PQ make and angle θ with centre O and has R radius of curvature.



Before bending length of filament PQ = R dθ

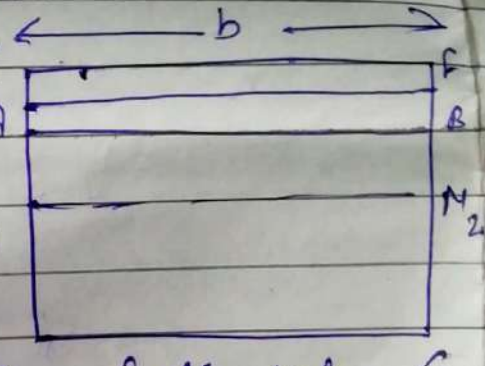
Let the layer P'Q' z distance away from neutral axis

After bending PQ to P'Q' change in length = (R+z) dθ

Increase in length = $(R+z)d\theta - Rd\theta$

$= z d\theta$

Strain = $\frac{z}{R}$



, consider a rectangular bar EFGH having EF = b and H = d and $M_1 M_2$ is d neutral axis. The upper half part above EFM_2M_1 is extended and the lower half below G M_1M_2GH is compressed then

$Y = \frac{\text{Stress}}{\text{strain}}$

Stress = Y × strain

$\text{stress} = \frac{Yz}{R}$

$F = \frac{Yz}{R} \times bdz$

$\left[\text{Stress} = \frac{F}{A}, \quad F = \text{Stress} \times A\right]$

Bending moment of force

$(F \times z) = \frac{Yz\,bdz}{R} \times z = \frac{Yz^2 bdz}{R}$

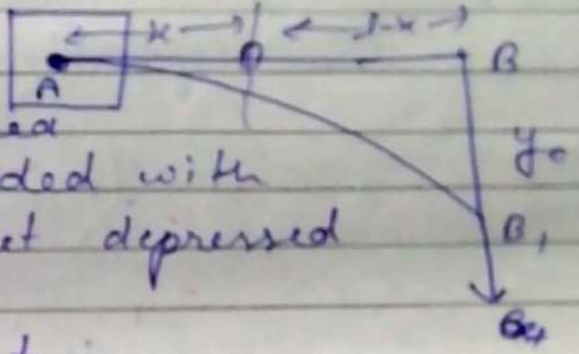
Moment of all force

$\sum (F \times z) = \frac{Y}{R} \sum (bdz)\, z^2$

it is analogues to $\sum mr^2$ which is called moment of inertia Hence here $\int bdz\, z^2 = I_g$ which is gometrical bending moment

$$G_1 = \frac{Y I_g}{R}$$

Consider a read AB whose one end A is end clamped and another end is loaded with weight W. The read get depressed y_0.



Restoring Binding moment

$$G' = W(l-x)$$

In equillibrium

$$\frac{Y I_g}{R} = W(l-x)$$

$$\frac{1}{R} = \frac{W}{Y I_g}(l-x)$$

$$\frac{1}{R} = \frac{d^2y}{dx^2}$$

$$\Rightarrow \frac{d^2y}{dx^2} = \frac{W}{Y I_g}(l-x)$$

By integrating we have

$$\frac{dy}{dx} = \frac{W}{Y I_g}\left[lx - \frac{x^2}{2}\right] + C_1$$

at $\frac{dy}{dx} = 0$ $x = 0$ $C_1 = 0$

$$\frac{dy}{dx} = \frac{W}{Y I_g}\left[lx - \frac{x^2}{2}\right]$$

By again integrating we have

$$y = \frac{W}{Y I_g}\left[\frac{lx^2}{2} - \frac{x^3}{6}\right] + C_2$$

At $x = 0$ $y = 0$ $C_2 = 0$

$$y = \frac{W}{YI_g}\left[\frac{lx^2}{2} - \frac{x^3}{6}\right]$$

At $x = l$,

The depression y_o at free end B is

$$y_o = \frac{W}{YI_g}\left[\frac{l^3}{2} - \frac{l^3}{6}\right]$$

$$y_o = \frac{Wl^3}{3YI_g}$$

for rectangular bar $I_g = \frac{bd^3}{12}$

$$y_o = \frac{Wl^3}{3Ybd^3} \times 4$$

$$\boxed{y_o = \frac{4Wl^3}{bd^3}}$$

This is the case when weight of beam is neglected.

If the weight of beam is not neglected

Case - I $W_1 = w \times l$ w = weight per unit leng

$$\frac{Y}{R}I_g = W(l-x) + \frac{w}{2}(l-x)\frac{(l-x)}{2}$$

$$\frac{Y}{R}I_g = W(l-x) + \frac{w}{2}(l-x)^2$$

$$\frac{1}{R} = \frac{1}{YI_g}\left[W(l-x) + \frac{w}{2}(l-x)^2\right]$$

Name ⇒ Preeti
Rollno ⇒ 40

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Que (1) a) Define the torsion rigidity of wire, obtain an expression for torsional rigidity in l, r and η. Also compare torque of solid with hollow cylinder.
b) Why are hollow - rods are used in Constructing the cycle frame.

2] Define Poission Ration (σ) and show that it is related with η and χ by the relation

b] Define Hooks law and define related terms.

3 a] What do you mean by bending Moment Derive expression for it in a rectangular bar clamped at one end and loaded at other.
b] What is the Poissons ratio and what is its max and min values.

Ans-3 b] Poission Ration can be defined as the ratio of lateral strain per unit stress to longitudinal strain per unit stress.

$$\sigma = \frac{E}{\alpha}$$

$$3n(1-2\sigma) = 2n(1+\sigma)$$

when the positive

$$1-2\sigma = 0$$

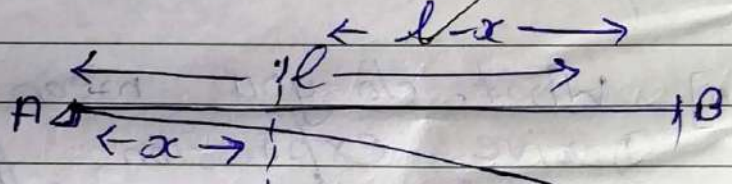
$$1 = 2\sigma$$
$$\sigma = \frac{1}{2}$$

when negative

$$1 + \sigma = 0$$
$$\sigma = -1$$

Maximum values $\frac{1}{2}$ and minimum value -1. It depend upon the nature of material of substance it lies between 0.2 to 0.4.

a]



When a rectangular bar clamped at one end and loaded at other. Its length is l and the P is point lies between it. and distance of AP is x and PB length is $(l-x)$ and Weight exist in downward direction.

$$\frac{YI_g}{R} = W(l-x)$$

$$\frac{1}{R}\frac{d^2y}{dx^2} = \frac{W(l-x)}{YI_g}$$

On Intergrating both side

$$\frac{dy}{dx} = \frac{W}{YI_g}\left(lx - \frac{x^2}{2}\right) + C_1$$

When $\frac{dy}{dx} = 0$ and $x = 0$

then $C_1 = 0$

Again Integrating both side

$$\int \frac{dy}{dx} = \frac{W}{EI_g} \int lx - \frac{x^2}{2}$$

$$y = \frac{W}{EI_g} \left(\frac{lx^2}{8} - \frac{x^3}{3 \cdot 2} \right) + C_2$$

$$y = \frac{W}{EI_g} \left(\frac{lx^2}{8} - \frac{x^3}{6} \right) + C_2$$

When $y = 0$ and $x = 0$

then $C_2 = 0$

And Put the $x = l$

$$y = \frac{W}{EI_g} \left(\frac{ll^2}{8} - \frac{l^3}{6} \right)$$

$$y = \frac{W}{EI_g} \left(\frac{l^3}{8} - \frac{l^3}{6} \right)$$

$$y = \frac{W}{EI_g} \left(\frac{3l^3 - l^3}{6} \right)$$

$$y = \frac{W}{EI_g} \frac{2l^3}{6_3}$$

$$\boxed{y = \frac{W}{EI_g} \frac{l^3}{3}}$$

$I_g = ak^2$

$W = \frac{W l^3}{\gamma a k^2 3}$

when rectangular area of cross section $\frac{bd^3}{12}$ and when Circular area of cross section $\frac{\pi r^4}{4}$

$W = \frac{12 W l^3}{3 \gamma bd^3}$ $\quad W = \frac{4 W l^3}{\gamma bd^3}$ for rectangular

$W = \frac{4 W l^3}{3 \gamma \pi r^4}$ $=$ $W = \frac{4 W l^3}{3 \gamma \pi r^4}$ for Circular

bending of Moment is defined as the ~~Force~~ Product of Force and Area is called bending Moment.

2] Poission Ratio :- It is defined as the ratio of lateral strain per unit stress and longitudinal strain per unit stress is called the Poission Ratio

$\sigma = \frac{\beta}{\alpha}$

When a Cylinder is length l and diameter is D when ~~the tension Pressure~~ apply on the Cylinder then increase its length and decrease its diameter.