

No. of Printed Pages : 4
Roll No.

170747/030745

4th Sem. / Civil

Subject : Structural Mechanics

Time : 3 Hrs.

M.M. : 100

SECTION-A

Note: Objective type questions. All questions are compulsory (10x1=10)

- Q.1 Define plastic material.
- Q.2 Unit of force _____.
- Q.3 Give any two examples of ductile material.
- Q.4 Unit of Bending Moment _____.
- Q.5 Unit of strain _____.
- Q.6 Brittleness is opposite to _____.
- Q.7 A retaining wall is subjected to pressure due to _____.
- Q.8 In a beam, deflection is _____.
- Q.9 Define Rankine's formula.
- Q.10 If $n < (2j-3)$, then the frame will be.

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SECTION-B

Note: Very short answer type questions. Attempt any ten questions out of twelve questions. (10x2=20)

- Q.11 Define shear force.
- Q.12 Define perfect frame.
- Q.13 Define limit of proportionality.
- Q.14 Define neutral axis.
- Q.15 Explain simple bending.
- Q.16 Explain Mohr's theorem.
- Q.17 Define Principle stress.
- Q.18 Define point of contra flexure.
- Q.19 Define shear strain.
- Q.20 Write the formula for extension of a uniform bar due to tensile load.
- Q.21 Define Hook's law.
- Q.22 Define elastic limit.

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x5=40)

- Q.23 Explain types of strain.
- Q.24 Explain stress-strain diagram.
- Q.25 Explain impact test.
- Q.26 Explain different types of support in beam.

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- Q.27 Find the M.O.I of a rectangular section 40 cm x 80 cm about horizontal axis passing through the centroid.
- Q.28 A bar of 40mm diameter is subjected to a pull of 100 KN. The measured extension on the gauge length of 250mm is 0.1mm and change in diameter is 0.005mm. Calculate.
 - a) Young's Modulus
 - b) Poisson's ratio
 - c) Bulk modulus.
- Q.29 Explain classification of columns.
- Q.30 What is passive earth pressure.
- Q.31 Draw the shear force and bending moment diagram of a cantilever beam carrying a point load at the free end.
- Q.32 Explain limit of proportionality with neat diagram.

SECTION-D

Note: Long answer type questions. Attempt any three questions out of four questions. (3x10=30)

- Q.33 Draw S.F.D and B.M.D for the beam as shown in fig. (i)

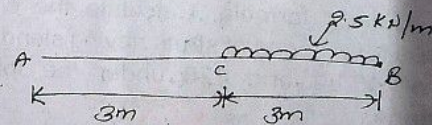


Fig-(i)

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Q.34 Find the moment of inertia about x-x axis and y-y axis of the section as shown in fig. (ii)

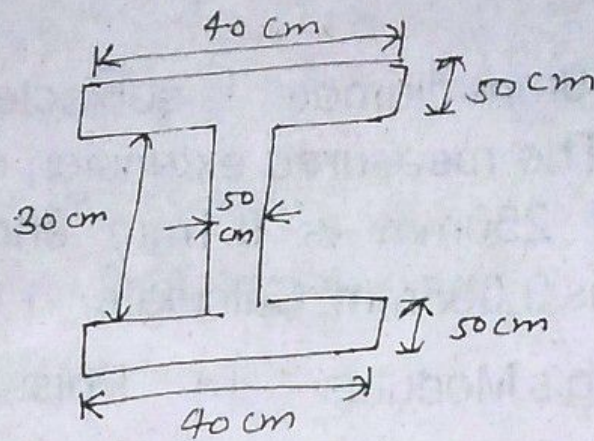
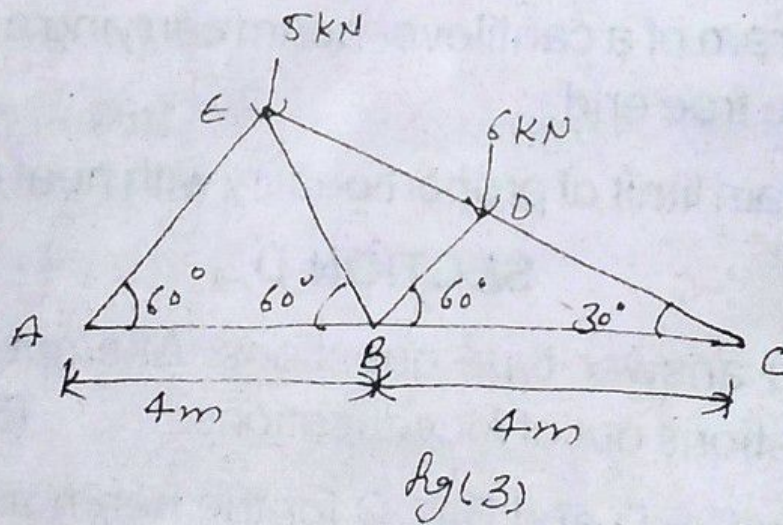


Fig-(ii)

Q.35 Find the forces in all the members of the truss shown in fig (iii) by method of joints.



Fig(3)

Q.36 Using Euler's formula, Calculate the crippling stresses for a series of struts having slenderness ratio of 40,80 and 120 under the following conditions.

- a) Both ends hinged b) Both ends fixed.

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