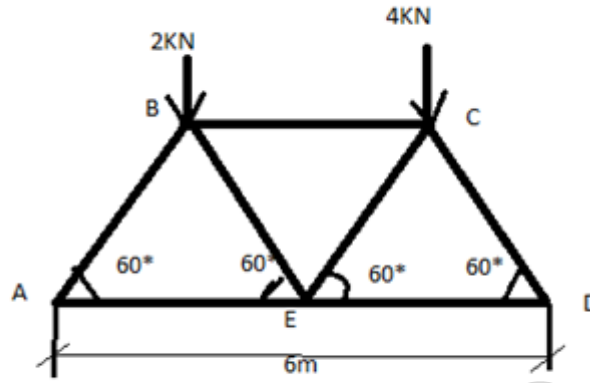


Seat No. **OCT-NOV 2025 WINTER EXAMINATION****1154 B.Tech. CBCS****Sub. Name: Strength Of Material-I****Sub. Code: 63340/73199/77771****Day and Date: Friday ,05-12-2025****Total Marks: 70****Time: 02:30 PM To 05:00 PM**

- Instructions:**
1. Assume suitable data wherever necessary and mention it boldly
 2. Draw neat labelled diagrams wherever necessary
 3. Figures to the right indicate full marks
 4. Use of Scientific calculator is allowed

Special Inst.: Q1 and Q5 are compulsory.
Solve any two from Q2 to Q4 and Q6 to Q8 respectively.

- Q1)** a) Define the following terms: (03) **[9]**
 i) Poisson' s Ratio
 ii) Temperature stress
 b) Explain the following terms: (03)
 i) Sagging and Hogging Bending moment
 ii) Point of Contraflexure
 c) Differentiate between method of joint and method of section. (03)
- Q2)** A square RCC column is 300mm x 300mm in cross section . It is reinforced with 4 **[13]**
 bars of 20mm diameter . Determine the load carrying capacity of the column if
 allowable stresses in concrete and steel are 7MPa and 140MPa respectively.
 $E_s=200\text{GPa}$ and modular ratio $m=13$. **(13)**
- Q3)** Draw the shear force and bending moment diagram indicating principal values for **[13]**
 an overhanging beam ABC with $AB=6\text{m}$ and $BC=3\text{M}$. It is loaded with udl of
 intensity 2KN/m all over the span in addition to a point load 5KN at free end C. Also
 locate the point of contraflexure. **(13)**
- Q4)** Q4)Analyse the truss by using method of joint. **[13]**



- Q5)** a) State the shear stress formula and explain the meaning of different symbols employed, (03) [9]
 b) State assumptions made in theory of simple bending. (03)
 c) Explain i) Resilience, ii) Proof Resilience. (03)
- Q6)** An unsymmetrical cast iron beam has overall depth 300mm, top flange 150mm x 25mm, bottom flange 250mm x 50mm and web thickness 25mm. The beam is 5m long and simply supported at ends. If permissible stresses are 100N/mm² in compression and 25N/mm² in tension. What uniformly distributed load beam will carry safely. (13) [13]
- Q7)** A simply supported beam of span 4m carries UDL of 80kN/m over the entire span. Draw the shear stress distribution diagram at support indicating all important values, overall depth=200mm, flange 150x 50mm, web 50x150mm. (13) [13]
- Q8)** A tensile load of 100kN is gradually applied to a circular bar of 4 cm diameter and 5m long. Assuming $E=200 \times 10^3 \text{ N/mm}^2$. Determine i) Stress in rod. ii) Stretch in rod. iii) Strain energy absorbed by the rod. (13) [13]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (101) Bachelor of Engineering (63340) Strength Of Material-I Part 2 SEM 3

2] (101) Bachelor of Engineering (77771) Strength Of Material-I Part 2 SEM 3

717498