QP Code: 10422QP

Seat No.	

Total No. of Pages: 2

Winter Examination Oct/Nov 2023

Subject Name: B.Tech. CBCS_63340/73199/77771 - Strength Of Material-I_06.01.2024_10.30 AM To 01.00 PM

Subject Code: 73199

Day and Date: - Saturday, 06-01-2024 **Total Marks: 70**

Time: - 10:30 am to 01:00 pm

Instructions.:

1) Figures to the right indicate full marks
2) Use of Scientific calculator is allowed
3) Use Sketches/Diagrams wherever necessary
4) Assume suitable data wherever necessary and mention it boldly
5) Que. 1 And 5 are compulsory
6) Attempt any two questions from Que no 2, 3 and 4.

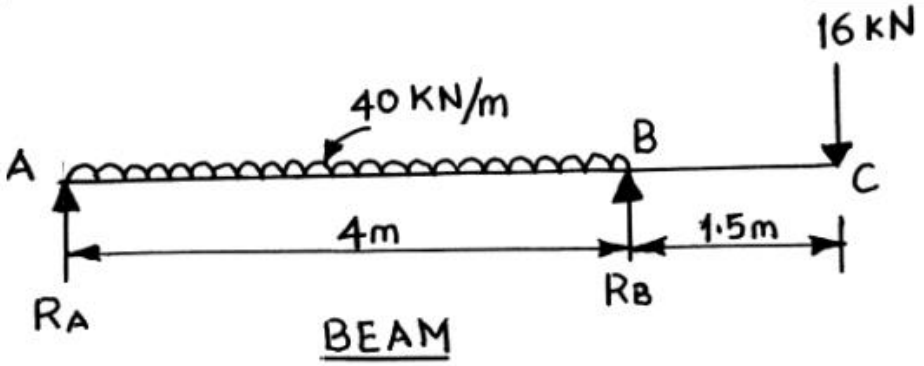
Special Instruction.:

Attempt any two questions from Que no 6, 7 and 8. SECTION I INCLUDES Que 1,2,3 and 4. SECTION II INCLUDES Que 5,6,7 and 8

Q.1. **a)Define following terms: [3]** **[9]**
i) Poisson's ratio , ii) Temperature stress, iii) Linear strain.
b) Explain the following terms : [3]
i) Sagging and hogging bending moment.
ii) Point of contraflexure.
c) Differentiate between method of joint and method of section. [3]

Q.2. **A steel rod of 25 mm diameter and 2 m long is subjected to an axial pull of 45 KN. Take E= 200GPa. Find : [13]**
i) Tensile stress ,
ii) Strain.
iii) Elongation.

Q.3. **Draw shear force and bending moment diagram for an overhanging beam as shown in figure.Locate the position of point of contra-flexure from A. [13]**



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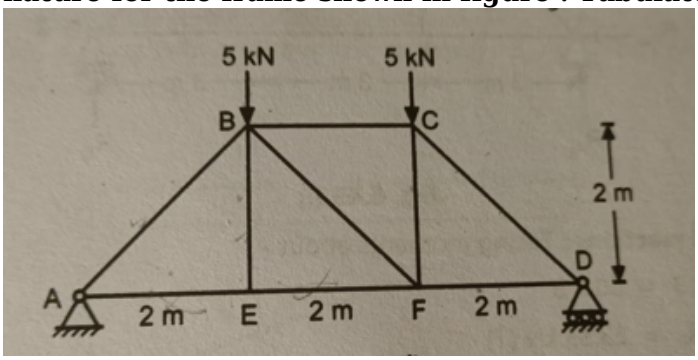
Q.4. **Determine the forces in the members AB, AE, BE and EF along with their nature for the frame shown in figure . Tabulate the results.** **[13]**



Q.5. **a)State flexural formula . Write the meaning of the symbols used in it. [3]** **[9]**
b)State the shear stress formula and explain the meaning of different symbols employed. [3]
c)Define : [3]
i) Strain energy
ii) Modulus of resilience

Q.6. **A symmetrical I - section of 5m span has flanges 250mm wide x 20mm thick and web 10mm thick . The overall depth is 500mm. It carries a udl of 20KN/m over its entire span. Calculate the magnitude of maximum bending stress induced .Sketch the stress distribution diagram.** **[13]**

Q.7. **A symmetrical I - section has two flanges 150x 20mm and vertical web 300x 10mm overall depth 340mm . The section is subjected to shear force of 100KN .Calculate the maximum shear stress developed in the section . Ixx= 1.763x 10^8 mm^4.** **[13]**

Q.8. **A steel rod 20 mm in diameter is 200 mm long. It is subjected to an axial pull of 40 KN. Calculate the strain energy stored in the rod if the load is applied :** **[13]**
i) Gradually
ii) Suddenly.

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