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| Seat No. | |
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S.Y.B.Tech. (Civil) (Semester - III) (CBCS) (Revised)
Examination, November - 2019
STRENGTH OF MATERIAL
Sub. Code : 73199

Day and Date : Thursday, 28 - 11 - 2019

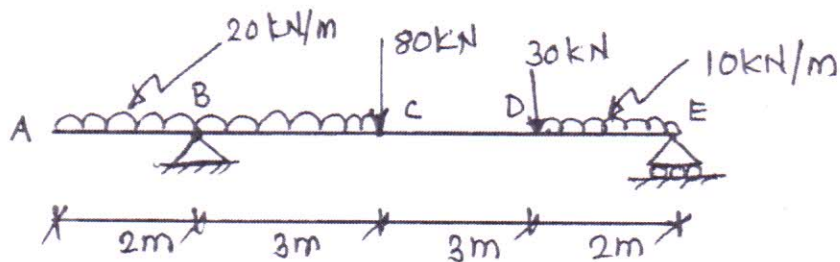
Total Marks : 70

Time : 10.00 a.m. to 12.30 p.m.

- Instructions :
- 1) Question one and five are compulsory and solve any two questions from each section.
 - 2) Figure to the right indicate maximum marks for the question.
 - 3) Neat sketches should be drawn wherever necessary.
 - 4) Use of non programmable calculator allowed.
 - 5) Assume any suitable data, if required and state it clearly.

SECTION - I

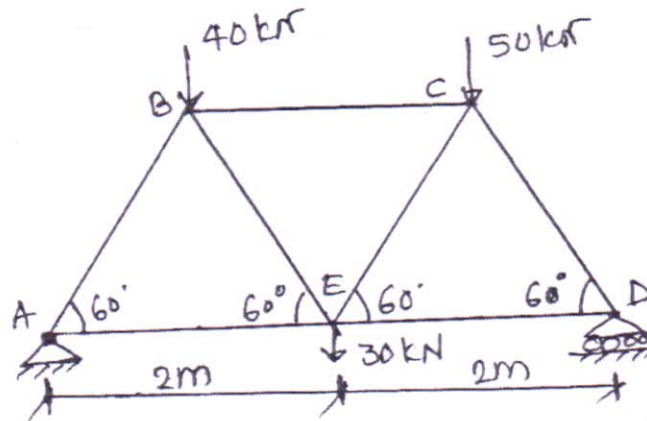
- Q1) a) Derive the relation between young's modulus and bulk modulus. [3]
 b) Explain inter-relationship between bending moment, shear force and load in beam. [3]
 c) Differentiate between method of joint and method of section. [3]
- Q2) A bar of 25 mm diameter is subjected to a pull of 40 kN. The measured extension on gauge length of 200 mm is 0.085 mm and change in diameter is 0.003 mm. Calculate Poisson's ratio and the three values of the moduli. [13]
- Q3) Draw shear force diagram and bending moment diagram for the beam shown in Fig. [13]



P.T.O.

Q4) Analyse the truss by using method of joint.

[13]



SECTION - II

- Q5) a) State the shear stress formula and explain the meaning of different symbols employed. [3]
 b) State assumptions made in theory of simple bending. [3]
 c) Define [3]
 i) Strain energy
 ii) Modulus of resilience
- Q6) A cast iron beam of T-section, 8 m long is simply supported at its ends. It carries a udl of 1.5 kN/m over entire length. Determine the bending stresses and show it graphically. Flange dimensions are 100 mm × 20 mm and web dimensions are 120 mm × 20 mm. [13]
- Q7) A T-shaped beam cross-section has its top flange 200 mm wide × 50 mm thick whereas its web is 200 mm deep and 50 mm wide. Sketch the shear stress variation within the section subjected to a shear force of 400 kN. [13]
- Q8) A weight of 15 kN falls through 10 mm on collar rigidly attached to the lower end of a vertical bar of length 3 m and having area of 6 cm². What are the instantaneous maximum stress and the corresponding instantaneous maximum extension of the bar. Adopt $E = 200 \text{ GPa}$. [13]

