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B.E / B.Tech ( Full Time ) DEGREE EXAMINATIONS, APRIL / MAY 2014

CIVIL ENGINEERING

Third Semester

CE 8302-Strength of Materials-I

(Regulation 2008)

Time : 3 Hours

Answer ALL Questions

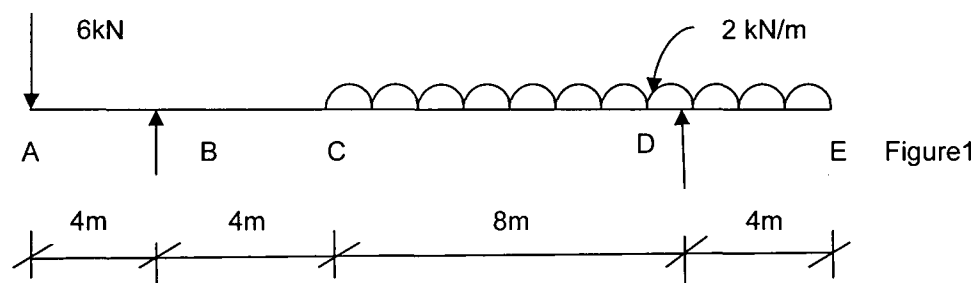
Max. Marks 100

**PART-A (10 x 2 = 20 Marks)**

1. What is Young's modulus?
2. Mohr's circle- define.
3. Distinguish between perfect and imperfect frames.
4. Write the advantages of analyzing the plane truss by method of sections.
5. Write the assumptions for deriving bending formulae?
6. What are helical springs?
7. Write the assumptions required for deriving torsional formulae.
8. State Mohr's theorem.
9. The helical spring is subjected to a load of 100 kN and maximum deflection is 2mm. Calculate the stiffness of the spring.
10. Cantilever beam of length 10m length loaded with a uniformly distributed load of 10 kN/m, draw the conjugate beam of the given beam.

**Part – B ( 5 x 16 = 80 marks)**

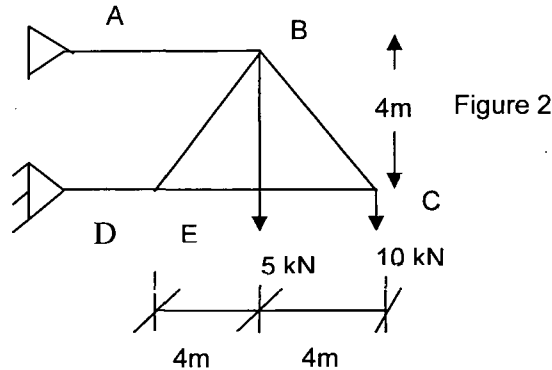
11. Draw the shear force and bending moment diagrams of overhanging beam as shown in the Figure 1.



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12. a) Calculate the members forces of truss as shown in Figure 2 by method of section.



(OR)

- b) Calculate the member forces of truss (Figure 2) by method of joints.

13. a) (i) Rectangular beam of 150mm width and 300mm height, subjected to a bending moment of 60 kN.m, calculate bending stresses in the system.  
(ii).The beam of width 'b', height 'h', and the shear stress acting across the section is  $q$ , then calculate the shear stress distribution across the section.

(OR)

- b) Derive the bending formulae.

14. a) A shaft of 100mm diameter, 1.5m length subjected to 300 revolutions per minute and power transmitted is 240 k.W. At the maximum shear stress, what will be the angle of twist of the shaft? Take  $G= 8 \times 10^4 \text{ N/mm}^2$ .

(OR)

- b) Derive the torsional formulae.

15. a) Simply supported beam of 8m long, subjected to a uniformly distributed load of 60 kN/m. Calculate the maximum slope, maximum deflection and slope at 3m from left hand support.  $EI = 25000 \text{ kNm}^2$ .

(OR)

- b) Simply supported beam of 6m span subjected to the two point loads of 60 kN and 80kN at 1.5m and 3m from the left hand support, calculate maximum slope, maximum deflection by Maccaulay's method.  $EI = 25000 \text{ kNm}^2$ .