Register Number :

Name of the Candidate :

6 0 8 0

B.E. DEGREE EXAMINATION, 2008

(CIVIL, CIVIL AND STRUCTURAL ENGINEERING)

(FOURTH SEMESTER)

CLEC - 404 / CSEC - 404 / PCSEC - 202. MECHANICS OF SOLIDS - II

(Common with Part - Time - Structural Engineering - Second Semester)

May] [Time : 3 Hours

Maximum : 60 Marks

UNIT - I

1. Determine the forces in various members of the truss shown in figure - 1.

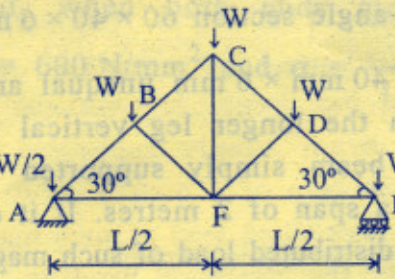
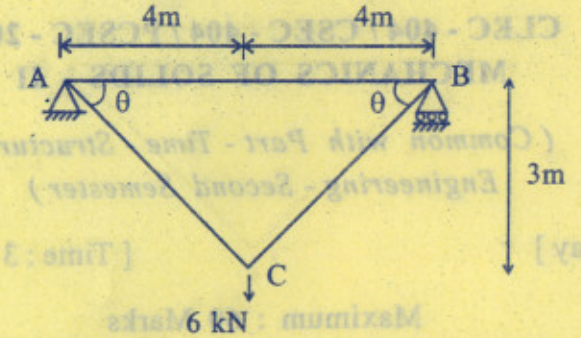


Figure - 1.

(OR)

Turn over

2. Determine the vertical and horizontal deflections of the point C of the pin jointed frame shown in figure - 2. The cross sectional area of AB is 100 mm^2 and of AC and BC are 150 mm^2 each. $E = 2 \times 10^5$ N/mm^2.



UNIT - II

3. Determine the principal moment of inertia for an unequal angle section 60 × 40 × 6 mm.

4. A 60 mm × 40 mm × 6 mm unequal angle is placed with the longer leg vertical and is used as a beam simply supported at the ends. Over a span of 2 metres. If it carries a uniformly distributed load of such magnitude as to produce the maximum bending moment of 0·12 kNm, determine the maximum deflection of the beam. $E = 2{\cdot}1 \times 10^5$ N/mm^2.

UNIT - III

5. A beam carries a uniformly distributed load of 50 kN/m over a span of 2 m along with an axial compressive force 50 kN. The beam section is rectangular having depth equal to 240 mm and width equal to 12 mm. Compute the

   (i) Maximum fibre stress.

   (ii) Fibre stress at a point 0·5 m from the left end of the beam and 80 mm below the neutral axis.

6. A cast iron hallow column having 100 mm external diameter and 80 mm interval diameter is used as a column of 2·4 mm length. Using Rankine's formula, determine the cripping load, when both ends are fixed. Take $f_c = 600$ N/mm^2 and $\alpha = \frac{1}{1,600}$.

UNIT - IV

7. A thin cylindrical steel has an internal diameter of 250 mm and is 6 mm thick. It is subjected to an internal pressure of 3 MN/m^2. Estimate the circumferential and longitudinal stresses if the ends of the cylinder are closed.

8. A thick cylinder 125 mm inside diameter and 250 mm out side diameter is subjected to an internal fluid pressure of 50 N/mm^2. Calculate the maximum and minimum intensities of circumferential stress and sketch the distribution of circumferential stress intensity and radial pressure intensity across the section.

UNIT - V

9. A small motor of mass 20 kg is symmetrically mounted on four equal springs each with a spring constant of 25 N/cm. Estimate the frequency and period of vibration of the motor.

10. Write a note on :

    (i) Simple harmonic motion

    and (ii) Torsional vibration of shafts.