Code: R7220103

R07

B.Tech II Year II Semester (R07) Supplementary Examinations December/January 2015/2016

STRENGTH OF MATERIALS - II

(Civil Engineering)

(For 2008 regular admitted batch only)

Time: 3 hours Max. Marks: 80

Answer any FIVE questions

All questions carry equal marks

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1 A point in a strained material is subjected to two mutually perpendicular stresses of 250 MPa (tensile) and 150 MPa (Compressive). Each of these stresses are accompanied by a shear of 100 MPa. Determine the intensities of normal, tangential and resultant stresses on a plane inclined at 40^o anti-clockwise to the axis of the major stress using **Mohr's Circle** method.

2 (a) A solid shaft of 150 mm diameter is used to transmit torque. Find the maximum torque that can be transmitted by the shaft if the shear stress is not to exceed 40 MPa.

(b) The shearing stress in a solid shaft is not to exceed 45 MPa when the torque transmitted is 40,000 N-m. Determine the minimum diameter of the shaft required.

3 A T-section joist is made of 140 mm X 15 mm flange at top and a web of 15 mm thickness. The overall depth is 120 mm. This T-section is used as a strut with one end fixed and the other end hinged. Determine the Rankin's crippling load for the column. Take f_c = 700 MPa. Rankin's constant as 1/1800.

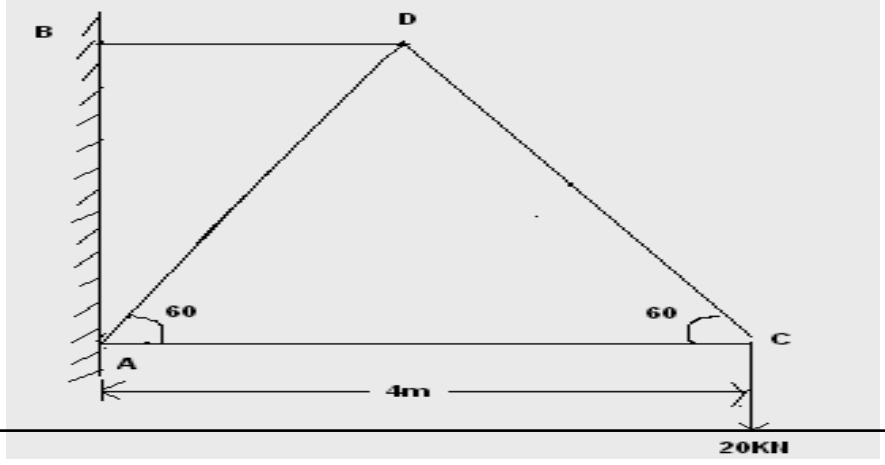
4 Determine the maximum deflection that occurs in a cylindrical steel strut of 1.3 m length and 33 mm diameter. The strut is hinged at both ends and is subjected to an axial thrust of 21 kN at its ends and a transverse point load of 1.9 kN at the centre. Take E = 210 GN/m^2.

5 The density of masonry and soil may be assumed as 24 kN/m^3 and 21 kN/m^3 respectively. The angle of repose of the soil is 43^o. Find the total pressure on the retaining wall per meter length and the point where the resultant cuts the base. Also find the maximum and minimum intensities of stress at the base.

6 Determine the principal moments of inertia for an unequal angle section 70 mm X 50 mm X 6 mm either by analytical or graphical method.

7 A semicircular beam of radius 4.6 m is simply supported on three equally spaced columns. The beam carries a uniformly distributed load of intensity 12 kN/m. Draw the bending moment and torsional moment diagrams for the beam indicating the values at salient points.

8 Analyze the Cantilever pin jointed truss shown below by method of joints and compute forces in all the members



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