Code No: R05220103 **R05** **Set No. 2**

II B.Tech II Semester Examinations,December 2010
STRENGTH OF MATERIALS-II
Civil Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Derive the general expressions and explain the procedure of finding deflections in a beam subjected to unsymmetrical bending. [16]

2. Derive the equation for Maximum bending moment for a laterally loaded strut pinned at both ends and subjected to an axial thrust P and a lateral uniformly distributed load of intensity W per unit run? [16]

3. A semi circular beam of radius R, is supported on 3 equally spaced columns. If W is the load per unit length of the beam, derive expressions for B.M and twisting moments at any point P. and hence at supports. [16]

4. Using the method of sections, find the magnitude and nature of forces in all the members of the pin-jointed, simply-supported, plane frame shown in figure 3. Make the forces in the frame. [16]

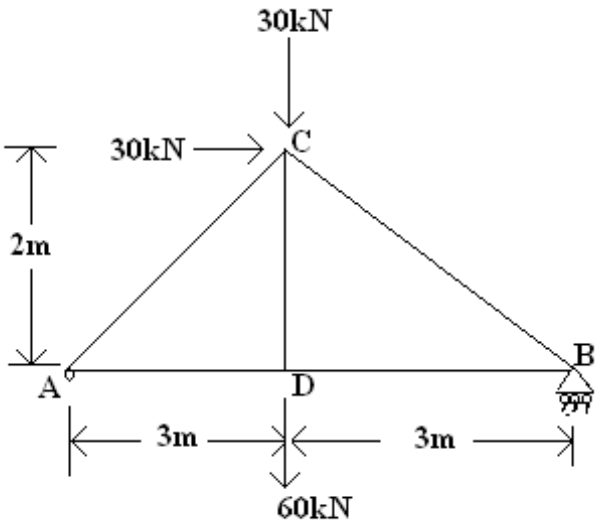

Figure 3

5. A masonry retaining wall, 7 metres high, is trapezoidal in section, 1 metre wide at the top and 3 metres at the base, with one side vertical. If the lateral pressure exerted by the retained material on the vertical face varies from zero at the top to $25KN/m^2$ at the base, calculate the maximum and minimum intensities of stress induced in the base, the weight of masonry being $21KN/m^3$. [16]

6. A closely coiled helical spring is to have a stiffness of 10 N/cm of compression under a max. load of 50N and max. shearing stress of $125N/mm^2$. The solid length of

spring is 45mm. Find the dia. of wire, mean dia of spring and the number of coils required. Take $N = 7 \times 10^4 N/mm^2$. [16]

7. (a) Derive the Euler's equation for the column with one end is fixed and the other is pinned or hinged.

   (b) A hollow alloy tube 5 m long with external and internal diameters equal to 40 mm and 25 mm respectively was found to extend by 6.4 mm under a tensile load of 60 KN. Find the buckling load for the tube, when used as a column with both ends pinned. Also find the safe compressive load for the tube, with a factor of safety of 4. [16]

8. Draw the Mohr's circle of stress if a piece of material is subjected to tensile stresses of 80 MPa and 35 MPa on mutually perpendicular planes. Find the plane across which the resultant stress is most inclined to the normal. Find also the magnitude of the resultant stress on this plane. [16]

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Code No: R05220103 **R05** **Set No. 4**

II B.Tech II Semester Examinations,December 2010
STRENGTH OF MATERIALS-II
Civil Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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2. Derive the general expressions and explain the procedure of finding deflections in a beam subjected to unsymmetrical bending. [16]

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4. Using the method of sections, find the magnitude and nature of forces in all the members of the pin-jointed, simply-supported, plane frame shown in figure 3. Make the forces in the frame. [16]

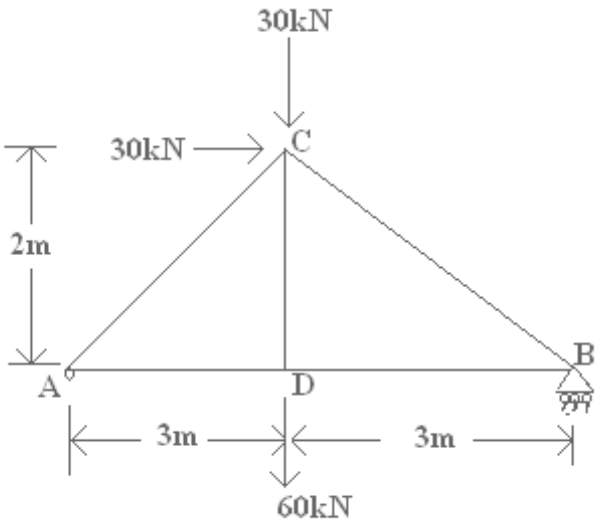

Figure 3

5. A semi circular beam of radius R, is supported on 3 equally spaced columns. If W is the load per unit length of the beam, derive expressions for B.M and twisting moments at any point P. and hence at supports. [16]

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Code No: R05220103 **R05** **Set No. 1**

II B.Tech II Semester Examinations,December 2010
STRENGTH OF MATERIALS-II
Civil Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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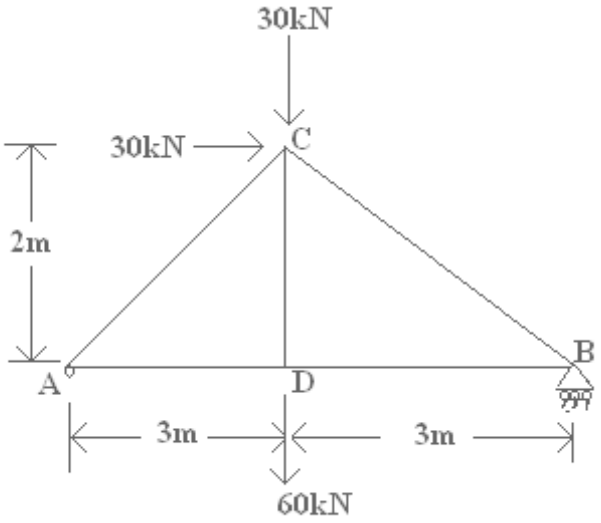

Figure 3

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Code No: R05220103 **R05** **Set No. 3**

II B.Tech II Semester Examinations,December 2010
STRENGTH OF MATERIALS-II
Civil Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
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   (b) A hollow alloy tube 5 m long with external and internal diameters equal to 40 mm and 25 mm respectively was found to extend by 6.4 mm under a tensile load of 60 KN. Find the buckling load for the tube, when used as a column with both ends pinned. Also find the safe compressive load for the tube, with a factor of safety of 4. [16]

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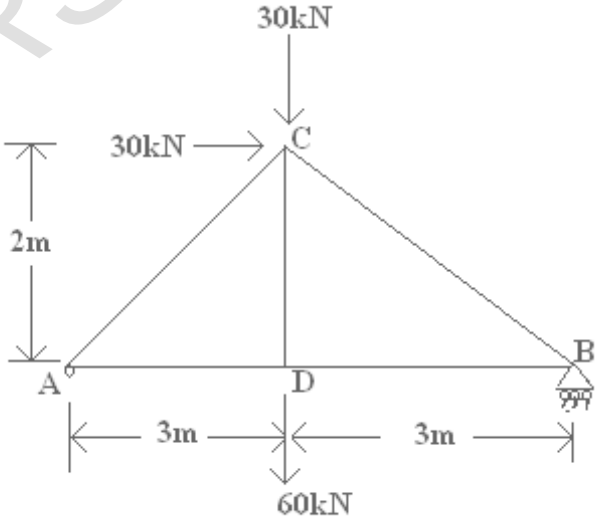

Figure 3

4. Derive the equation for Maximum bending moment for a laterally loaded strut pinned at both ends and subjected to an axial thrust P and a lateral uniformly distributed load of intensity W per unit run? [16]

5. A masonry retaining wall, 7 metres high, is trapezoidal in section, 1 metre wide at the top and 3 metres at the base, with one side vertical. If the lateral pressure

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