Code No: 07A40102 **R07** **Set No. 2**

II B.Tech II Semester Examinations,April/May 2012
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. A truss of span 7.5 mts is loaded as shown in figure 6 by method of joints find the reactions and forces in the members. [16]

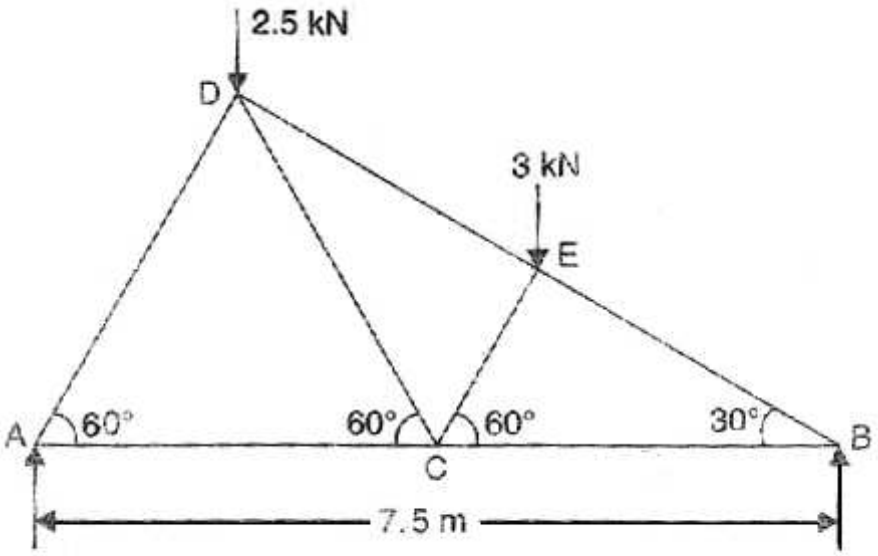

Figure 6

2. A timber joist 150 mm wide and 250 mm deep, is freely supported over a span of 4 mts. It is subjected to a bending moment of 50 Knm at the central section, the trace OY' of the plane of loading being inclined at 15^0 to the principal axis OY. If the bending moment is due to a total load of 40 Kn uniformly distributed over the whole span, calculate the central deflection. E = 10^4 N/mm^2. [16]

3. A weight of 2500 N is dropped on a closely coiled helical spring consisting of 16 turns. Find the height by which the weight is dropped before striking the spring so that he spring may be compressed by 200mm. The coils have a mean radius of 125mm and the dia. of the rod of the spring is 30mm.
Take C = 9 $\times 10^4 N/mm^2$. [16]

4. Calculate Euler's buckling load for a strut having T-section. The strut is 3m. long and hinged at both ends. The T - section has the following dimensions.
Flange - 10cm × 1 cm. ; Web - 7cm × 1 cm. E = 2 $\times 10^5 N/mm^2$. [16]

5. A hollow cylindrical cast iron column is 3.5 m. long, both ends being fixed. Design the column to carry an axial load of 300 KN. Using Rankine formula and adopt a

factor of safety of 4. the internal diameter may be taken as 0.6 times the external dia. Take $f_C = 600\text{N}/mm^2$, $\alpha = 1/1600$. [16]

6. Find deflection in the direction of P of the point A of the free end of the cylindrical bar as shown in Figure 4. The radius of the bar is r. [16]

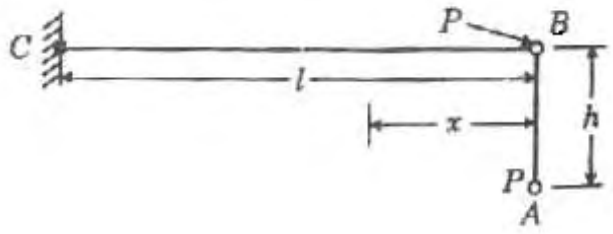

Figure 4

7. The section of the masonry pier 5 meters high is a hollow rectangle, external dimensions 3.6 m × 1.5 m, internal dimensions 3 m × 0.9 m. A horizontal thrust of 25 Kn is exerted At the top of the pier in the vertical plane bisecting the length. Calculate the maximum and minimum stress at the base. [16]

8. The principal tensile stresses at a point across two perpendicular planes are $90\text{N}/mm^2$ and $45\text{N}/mm^2$. Find normal and tangential stresses and resultant stress and its Obliquity on a plane at 20^0 with Major principal plane. Find also the intensity of stress which acts alone can produce the same maximum strain. Take poission's ratio as 0.25. [16]

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Code No: 07A40102 **R07** **Set No. 4**

II B.Tech II Semester Examinations,April/May 2012
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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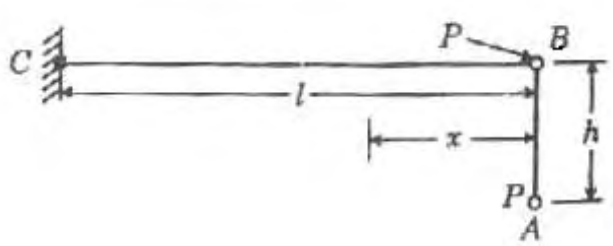
5. Find deflection in the direction of P of the point A of the free end of the cylindrical bar as shown in Figure 4. The radius of the bar is r. [16]



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6. A truss of span 7.5 mts is loaded as shown in figure 6 by method of joints find the reactions and forces in the members. [16]

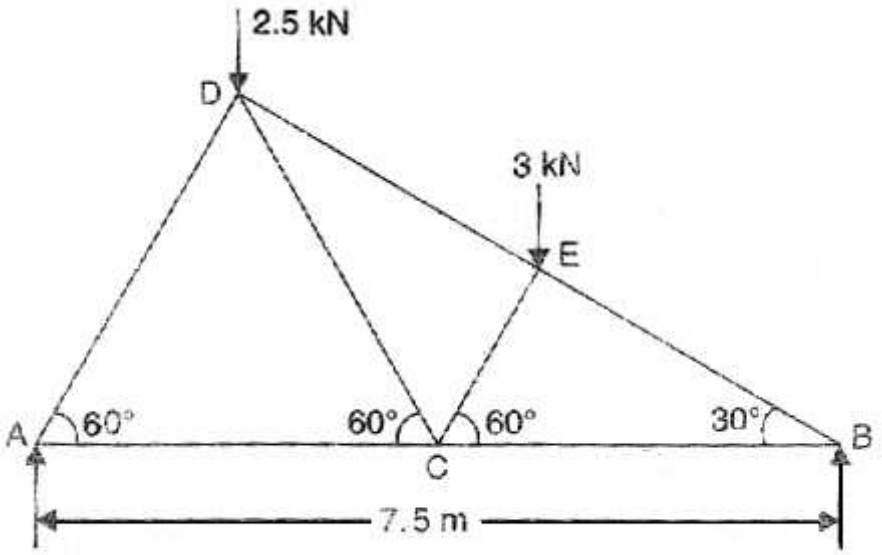

Figure 6

7. A weight of 2500 N is dropped on a closely coiled helical spring consisting of 16 turns. Find the height by which the weight is dropped before striking the spring so that he spring may be compressed by 200mm. The coils have a mean radius of 125mm and the dia. of the rod of the spring is 30mm.
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Code No: 07A40102 **R07** **Set No. 1**

II B.Tech II Semester Examinations,April/May 2012
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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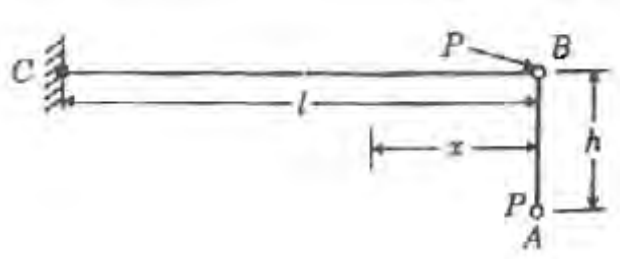
5. Find deflection in the direction of P of the point A of the free end of the cylindrical bar as shown in Figure 4. The radius of the bar is r. [16]



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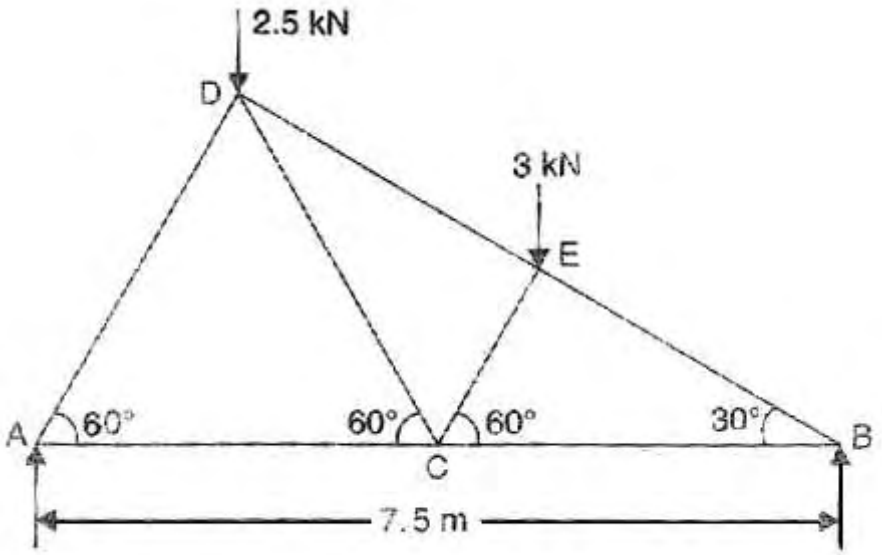

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Code No: 07A40102 **R07** **Set No. 3**

II B.Tech II Semester Examinations,April/May 2012
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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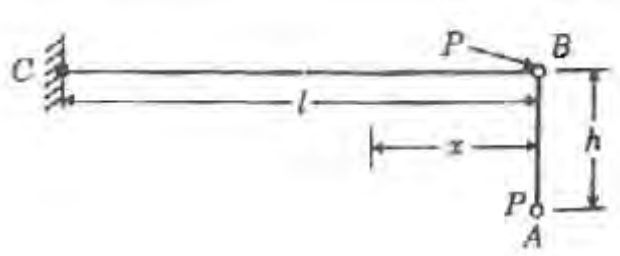

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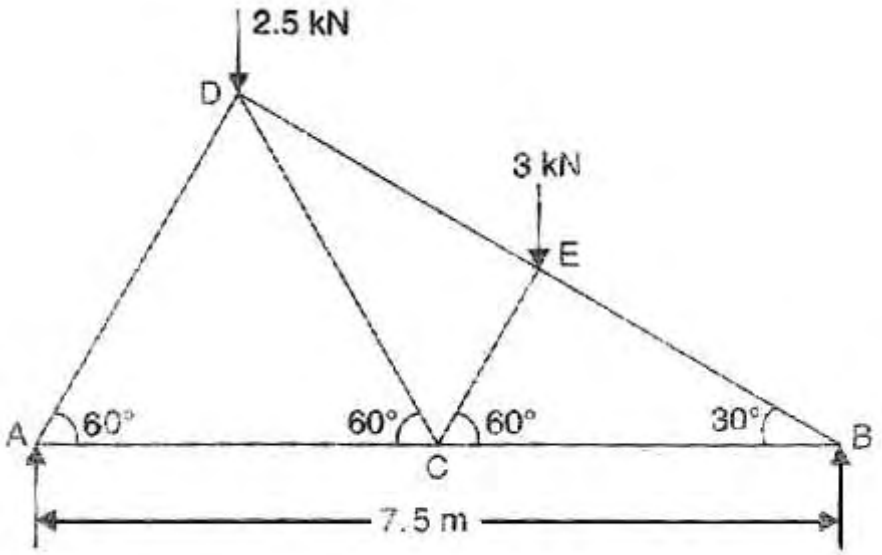

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