Code.No: 43034 | R07 | SET-2

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
II.B.TECH - I SEMESTER REGULAR EXAMINATIONS NOVEMBER, 2009
FOUNDATION OF SOLID MECHANICS
(AERONAUTICAL ENGINEERING)

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

Answer any FIVE questions
All questions carry equal marks

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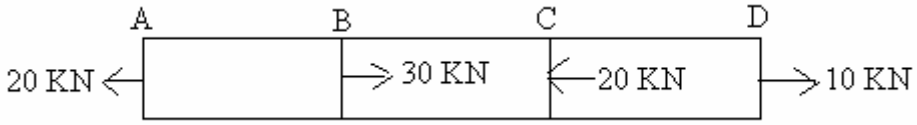
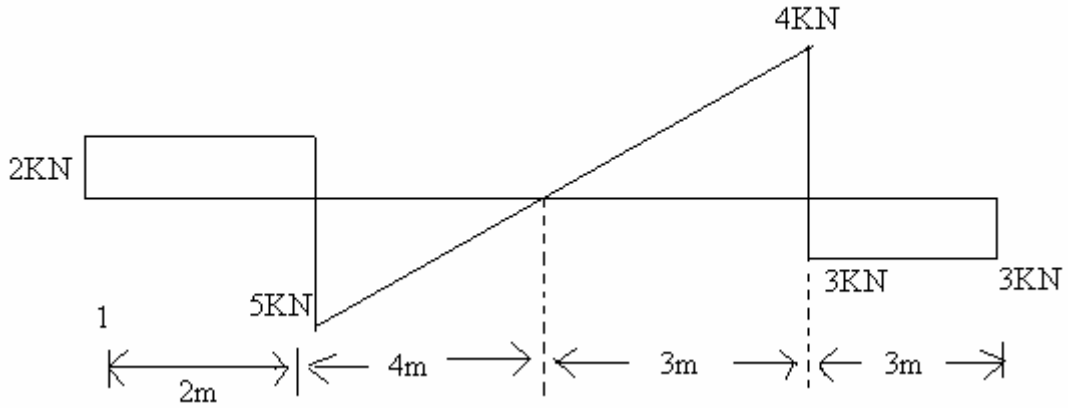
1.a) Explain the stres-strain diagram for mild steel with neat sketch and mark various limits of stresses.

b) What is the significance of load diagrams and draw the load diagram for the following steel bar



2.a) Define shear force and Bending moment and derive the relations with standard notations

b) The shear force diagram is shown below. Determine the loading and draw the B.M diagram.



3.a) Explain the presence of transverse shear stresses in beams due to transverse shear load

b) Derive the Equation for shear stress in flauges and web of an I section and draw the variation of shear stress

4.a) Define Neutral axis and section Modulus of a beam

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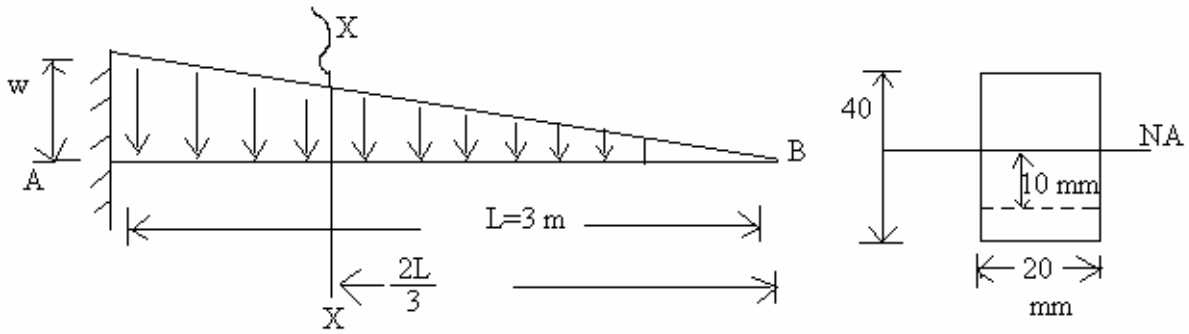
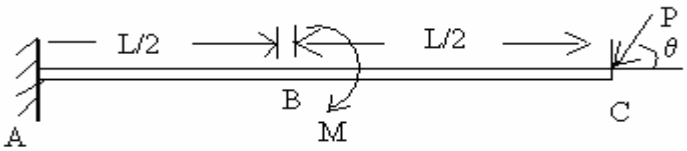
b)



Determine the bending stress X-X at the section at a distance of 10mm below the neutral axis.

5.a) Derive the flexure Equation of deflection



b) Determine the deflection at C for the cantilever beam loaded as shown above.

6. A cylindrical thin drum of 1000 mm in diameter and 3000 mm long has a shell thickness of 10mm. If the drum is subjected to an internal pressure of 3 N/mm^2
Determine:
   a) Change in diameter
   b) Change in length
   c) Change in volume

   $E=2X10^5$ N/mm^2, Poisson's ratio=0.25. [16]

7. What are the various types of semi permanent joints. Explain in detail with neat sketches [16]

8.a) What are the different cases of unsymmetrical bending
b) Derive the Equation for bending stress when a symmetrical section subjected to loading at an angle 'θ' to the vertical. [8+8]

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