Code.No: 43034 | R07 | SET-3

**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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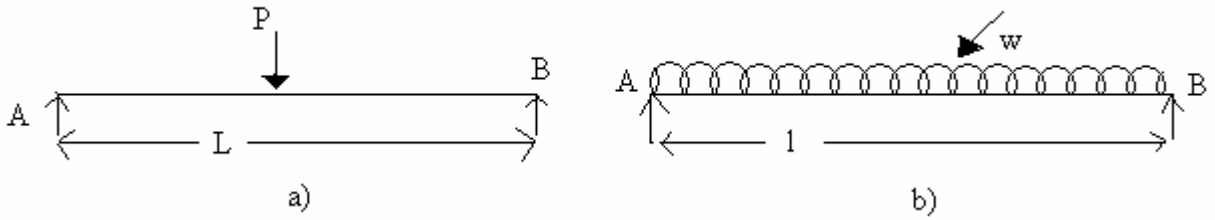
1.a) Why steel is more elasitc than rubber. Explain
b) Explain the mechanical properties of a material briefly in detail. [6+10]

2.a) The intensity of loading on a simply supported beam of 5m Spain increases gradually from 1 KN/m at one end to s KN/m run on the other end. Find the position and amount of maximum bending moment. Also draw the S.F. And B.M. diagrams. [16]

3.a)



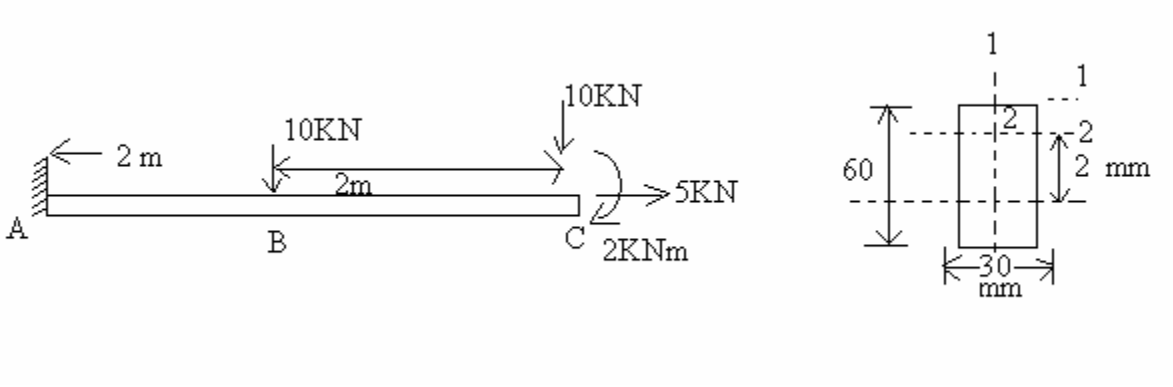

For the beams shown with different loading conditions, determine the ratio of Maximum bending moments, $\frac{M_a}{M_b}$ What should be the value of 'P' such that both the beams will have same bending moment

b) What is the significance of sectional modulus. [10+6]

**Cont....2**

4.a) Derive the equation for shear stress due to transverse shear load with standard notations

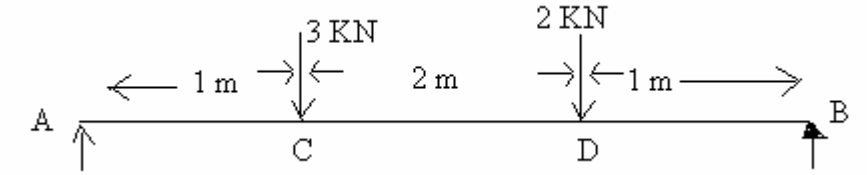
b)




For the beam shown, Determine the shear stress Between A & B at point '2' on the cross section. [16]

5.a) Explain the procedure of finding deflections using Macaulay's method

b)



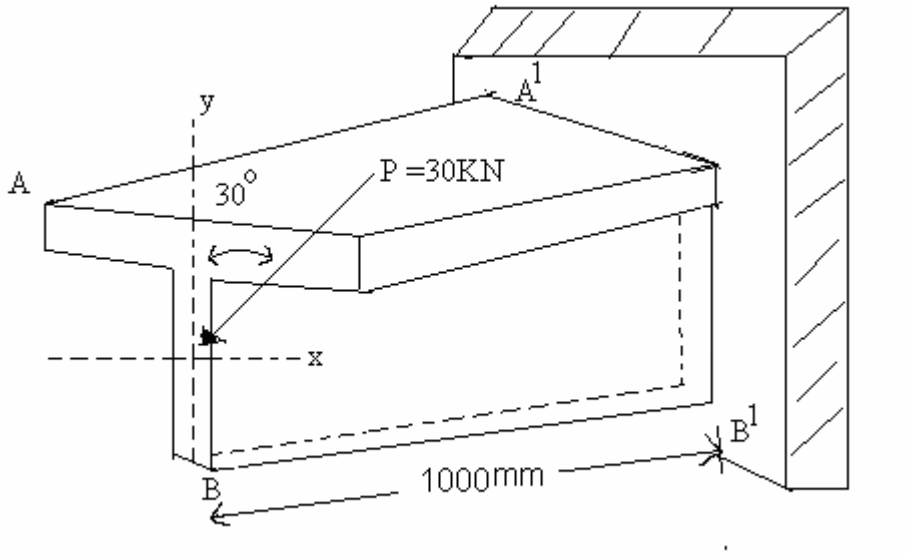

Determine the deflection at the centre of the beam. $E=2X10^5$ N/mm$^2$, $I=2X10^6$ mm$^4$ [8+8]

6.a) Define the stresses in thin walled pressure vessels.

b) A boiler is subjected to an internal steam pressure of 3 N/mm$^2$. The thickness of the boiler plate is 2.5 cm and the permissible tensile stress is 125 $\frac{N}{mm^2}$. Determine the maximum diameter, when the efficiency of longitudinal joint is 90% and that of circumferential joint is 35%. [8+8]

7. What are the types of rivelted joints. Explain various joints with the help of neat sketches. [16]

**Cont....3**




8. Determine the bending stress at $A'$ and $B'$ for the T-section shown. Flange dimension 100mm width and web dimensions 120mm height with uniform thickness of 5mm. [16]

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