SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act,1956)

Course & Branch :B.Arch - ARCH
Title of the Paper :Applied Mechanics — Max. Marks :80
Sub. Code :621204 — Time : 3 Hours
Date :17/05/2010 — Session :FN

PART - A (8 x 4 = 32)

Answer ALL the Questions

1. Define Triangle law of forces and parallelogram law of forces

2. Differentiate perfect and imperfect frame.

3. Draw stress strain diagram for the Mild Steel and mention its salient point.

4. Define Bulk Modulus and Poisson's ratio.

5. Differentiate Centroid and centre of Gravity.

6. State Parallel axis theorem and Perpendicular axis theorem.

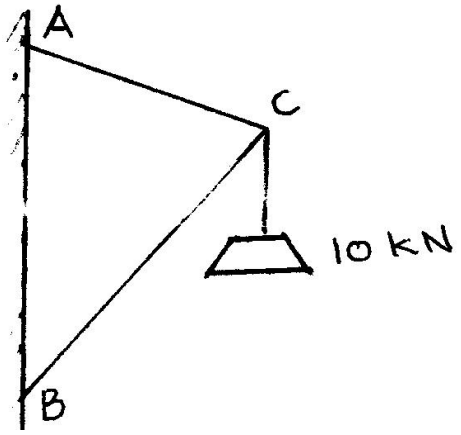
7. Define Shear Force and Bending Moment.

8. Draw S.F.D and B.M.D for the simply supported beam of span '1' carrying point load 'P' at 1/3 span.

PART – B (4 x 12 = 48)

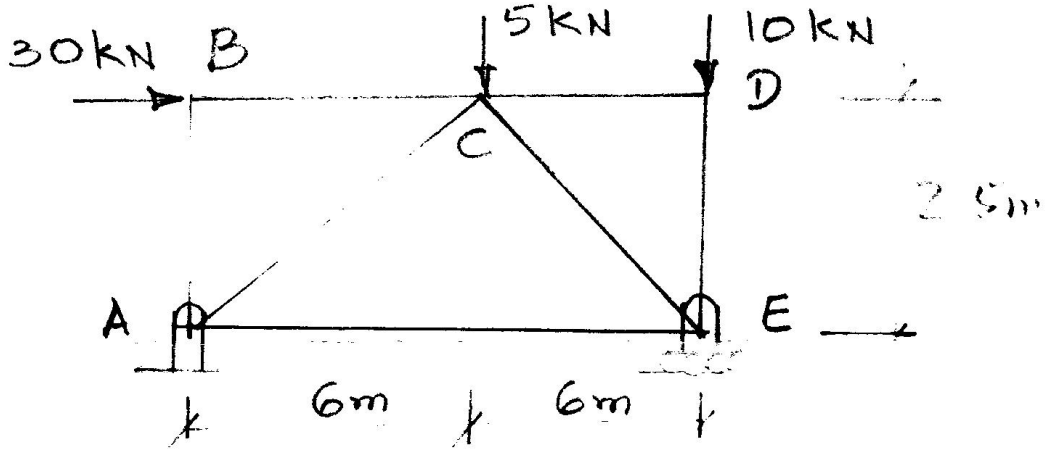
Answer All the Questions

9. A simple derrick crane showed below which carries a load of 10kN. The sides AB, BC and CA are 4m, 4m and 2m long. Find forces in AC and BC.



(or)

10. Find loads in members AB and CE by method of joint for the truss shown in figure.



11. A bar 450mm long 50mm square in section for the first 150mm, 25mm diameter for the next 150mm and 50 mm diameter for the remaining 150 mm length. Determine stress in each portion and the total elongation when a pull of 100kN is applied. Take $E=2x10^5$MPa.

(or)

12. A bar 30mm x 30mm x 250mm long is subjected to a pull of 90kN in the direction of its length. The extension of the bar was found to be 0.125 mm and decrease in lateral dimension is found

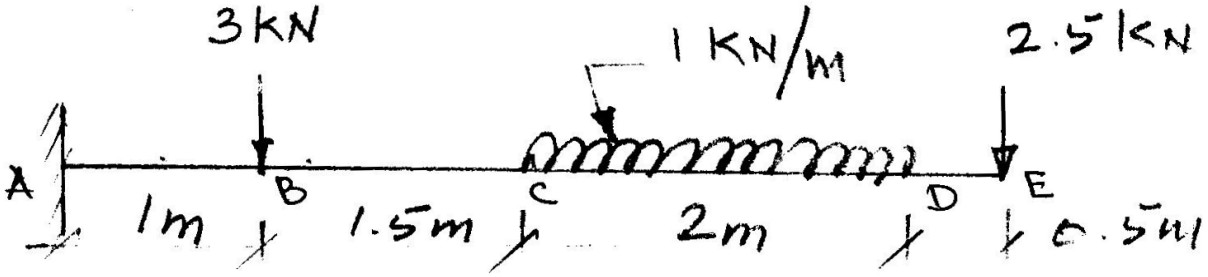
to be 0.00375mm. Find the young's Modulus, Poisson's ratio, Modulus of rigidity and Bulk modulus for the bar material.

13. Determine the moment of inertia and radius of gyration for the T-section having top width 200mm overall height 160mm and both flanges thickness 40mm about its centroidal y axis

(or)

14. Determine the co-ordinates x and y of a rectangular plate 180mm x 140mm in which a triangle portion was cut at right side top corner of size 70mm depth and 90mm length. In the same plate 90mm diameter circular hole was cut so that this point will be the centroid of the remaining shaded area.

15. Draw S.F.D and B.M.D for the shown below.



(or)

16. Draw S.F.D and B.M.D for the simply supported beam shown below. What is the maximum bending moment and shear force value?