SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act, 1956)

Course & Branch: B.Arch
Title of the paper: Applied Mechanics
Semester: II — Max.Marks: 80
Sub.Code: 621204(2006-2007-2008) — Time: 3 Hours
Date: 20-05-2009 — Session: FN

PART - A (8 X 4 = 32)

Answer ALL the Questions

1. When a truss is said to be internally determinate?

2. State (a) Lami's Theorem
   (b) Free body diagram

3. Draw the Stress-Strain curve for mild steel and explain the salient points.

4. Derive the relationship between E, K and Poisson's ratio.

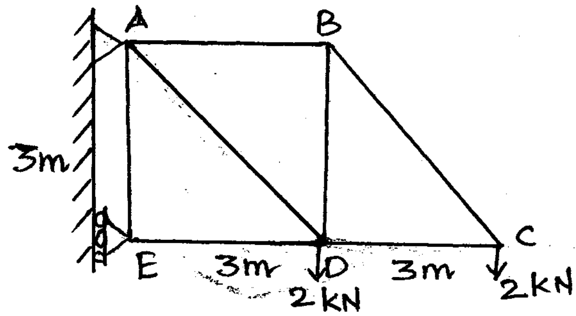
5. State (a) Parallel axis theorem
   (b) Perpendicular axis theorem.

6. Give the significance of radius of gyration.

PART – B (4 x 12 = 48)

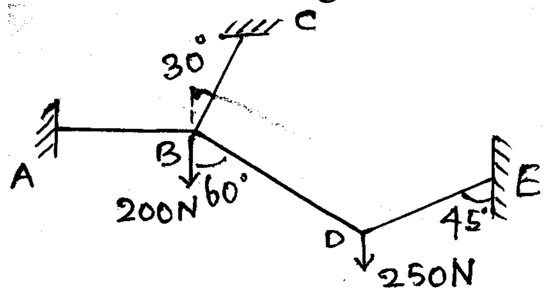
Answer ALL the Questions

9. Determine the forces in all the members of the truss shown in figure 1.



(or)

10. A system of connected flexible cables shown in figure 2 is supporting two vertical forces 200N and 250N at points B and D. Determine the forces in various segments of the cable.



11. A mild steel plate, 20mm thick and 300mm wide at one end, tapers uniformly to 15mm thick and 200mm wide at the other end. Find the elongation under an axial pull of 20kN, if the length is 2m. Take $E=2x10^5 N/mm^2$.

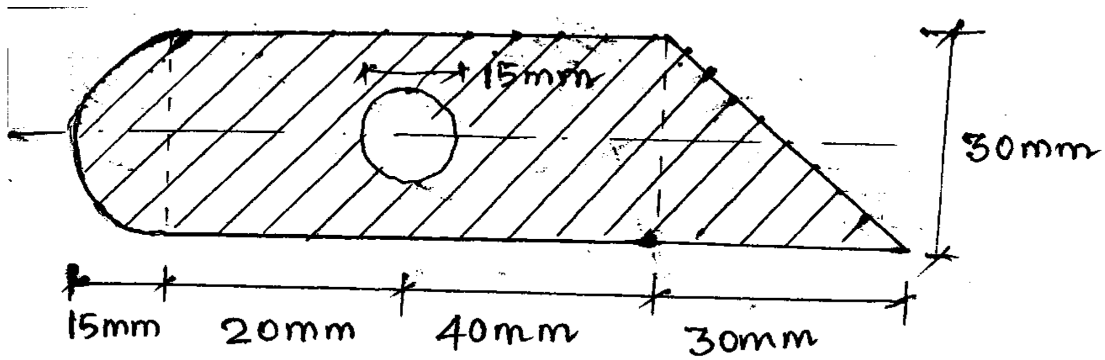
(or)

12. A 2m long steel bar is having uniform diameter of 40mm for a length of 1m. In the next 0.5m, its diameter gradually reduces to 'd' mm and for the remaining 0.5m length, diameter remains 'd' mm uniform. When a load of 300kN was applied, the extension observed is equal to 5.78mm. Determine the diameter 'd' of the bar if $E=2x10^5 N/mm^2$.

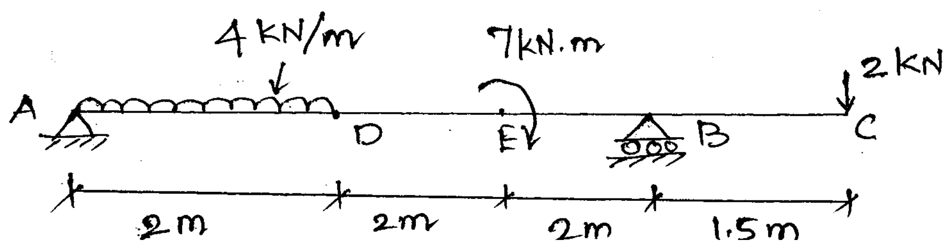
13. A hemisphere of diameter 60mm is placed on top of a cylinder, whose diameter is also 60mm. The height of cylinder is 75mm. Find the common centre of gravity of composite body.

(or)

14. For the shaded area shown in figure 3 find the moment of inertia about base.



15. Draw the shear force and bending moment for the beam loaded as shown in figure 4.



(or)

16. A beam of length 10m is simply supported at its ends and carries a load which varies uniformly from zero at left end to 40kN per meter at right end. Draw the shear force and bending moment diagrams.