

[05 – 2110]

II/IV B.E. DEGREE EXAMINATION.

First Semester

Electronics and Communication Engineering

(Common with EEE and EIE)

ENGINEERING MECHANICS AND STRENGTH OF
MATERIALS

(Common with M.S. (EEE))

(Effective from the admitted batch of 2006–2007)

Time : Three hours

Maximum : 70 marks

Question 1 is compulsory.

Answer any FOUR from the remaining.

All questions carry equal marks.

1. (a) What is difference between centroid and centre of gravity?
- (b) State perpendicular axis theorem.
- (c) Explain the concept of mass moment of Inertia.
- (d) What is "Simple Harmonic Motion"?

- (e) What is Mohr's circle? State its use.
- (f) What is functional difference between shear force diagram and bending moment diagram?
- (g) Define elasticity modulus and compress stress.

2. Determine the magnitude and line of action of the resultant of forces in Fig. 1.

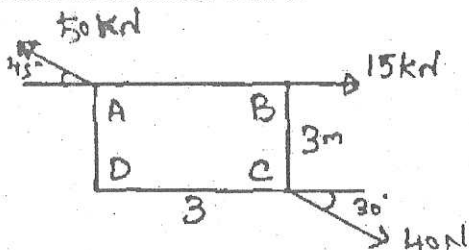


Fig.1

3. Find the centroid of the lamina shown in below. All dimensions are in mm.

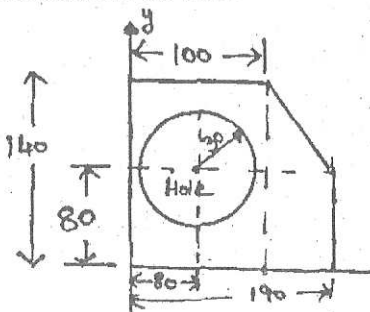


Fig.2

4. State and prove M.I. of triangular section is $\frac{bh^3}{12}$.
5. A car of mass 150 Kg is travelling on a horizontal track at 36 km/hour. Determine the time required to stop the car. The coefficient of friction between the tyres and the road is 0.45. Use impulse-momentum method.
6. At a point in a strained material there is tensile stress of 80 N/mm^2 upon a horizontal plane and compressive stress of 40 N/mm^2 upon a vertical plane. There is also a shear stress of 48 N/mm^2 upon each of these planes. Determine the planes of maximum shear stress at the point. Determine also the resultant stress on the planes of maximum shear stress.
7. Draw shear force and bending moment for the simply supported beam shown in Fig. 3

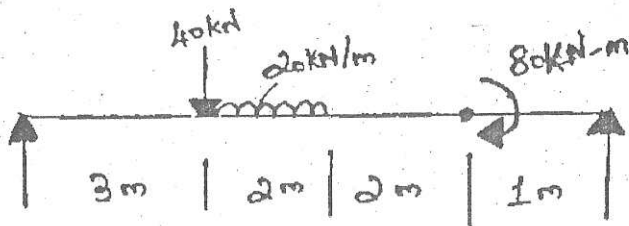


Fig. 3

8. A circular pipe of external diameter 70 mm and thickness 8 mm is used as a simply supported beam over an effective span 2.5 m. Find the maximum concentrated load that can be applied at the centre of the span if permissible stress in tube is 150 N/mm^2 .