

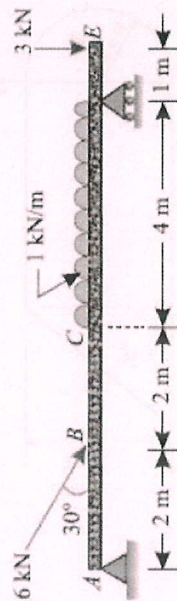
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B.Tech I Year II Semester Supplementary Examinations May-2022
BASICS OF ENGINEERING MECHANICS
(Mechanical Engineering)

Max. Marks: 60

(Answer all Five Units **5 x 12 = 60 Marks**)

- 1** A beam ABCDE hinged at A and supported on rollers at D, is loaded as shown in Fig. **L4** **12M**
Find the reactions at A and D.

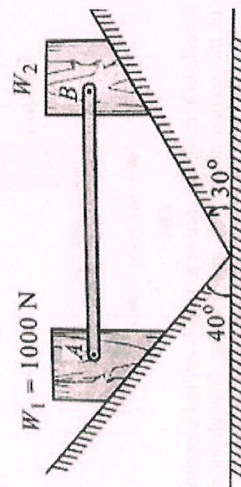


OR

- 2 a Explain free body diagram with example. L2 4M
b State and prove Lami's theorem. L4 8M

UNIT-III

- 3** Two blocks W_1 and W_2 resting on two inclined planes are connected by a horizontal bar AB as shown in Fig. If W_1 is equals 1000 N, determine the maximum value of W_2 for which the equilibrium can exists. The angle of limiting friction is 20° at all rubbing faces.

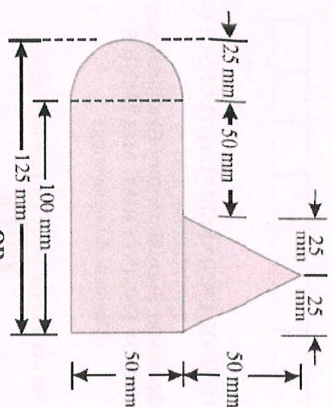


OR

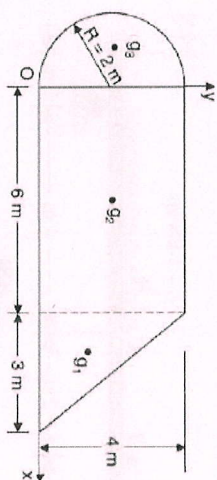
- 4** A screw jack raises a load of 40 kN. The screw is square threaded having three threads per 20 mm length and 40 mm in diameter. Calculate the force required at the end of a lever 400 mm long measured from the axis of the screw, if the coefficient of friction between screw and nut is 0.12. **L4 12M**

UNIT-III

- 5 A uniform lamina shown in Fig. consists of a rectangle, a circle and a triangle. Determine the centre of gravity of the lamina. All dimensions are in mm



OR

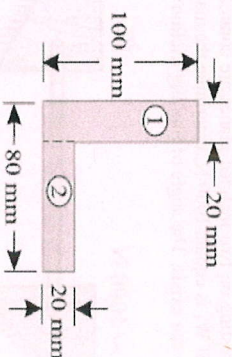


UNIT-IV

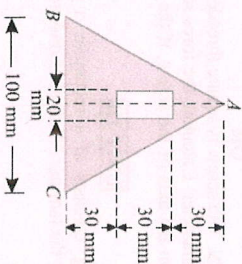
- 6 Determine the centroid of the area shown in Fig. with respect to the axis shown.

L1 12M

- 7 Find the moment of inertia about the centroidal X-X and Y-Y axes of the angle Section L1 12M

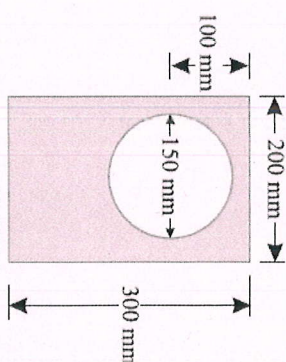


OR



- 8 A rectangular hole is made in a triangular section as shown in Fig. Determine the moment of inertia of the section about X-X axis passing through its centre of gravity and the base BC. L2 6M

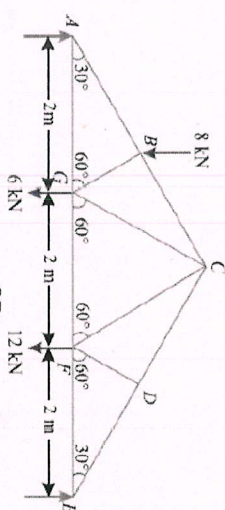
- b Find the moment of inertia of a hollow section shown in Fig. about an axis passing through its centre of gravity or parallel X-X axis. L1 6M



UNIT-V

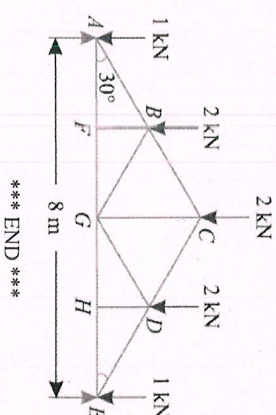
- 9 An inclined truss loaded as shown in Fig.

L4 12M



OR

- 10 A king post truss of 8 m span is loaded as shown in Fig. Find the forces in each member of the truss and tabulate the results. L4 12M



*** END ***