Q.P. Code: 20CE0163 **R20**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year II Semester Regular & Supplementary Examinations October-2022

BASICS OF ENGINEERING MECHANICS

(Common to ME & AGE)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1	a	Classify different system of forces with suitable examples.	L3	6M
	b	The resultant of the two forces, when they act at an angle of 60o is 14 N. If the same forces are acting at right angles, their resultant is √137 N. Determine the magnitude of the two forces.	L4	6M

OR

2	a	Explain free body diagram with example.	L2	6M
	b	State and prove Lami's theorem.	L1	6M

UNIT-II

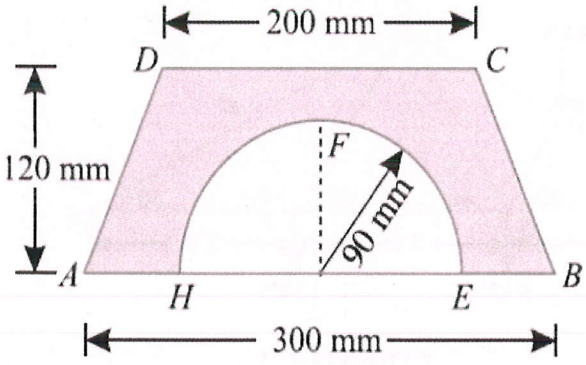
3	a	State laws of friction.	L1	6M
	b	Explain *Cone of Friction* with a neat sketch.	L2	6M

OR

4		A screw jack raises a load of 40 kN. The screw is square threaded having three threads per 20mm 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

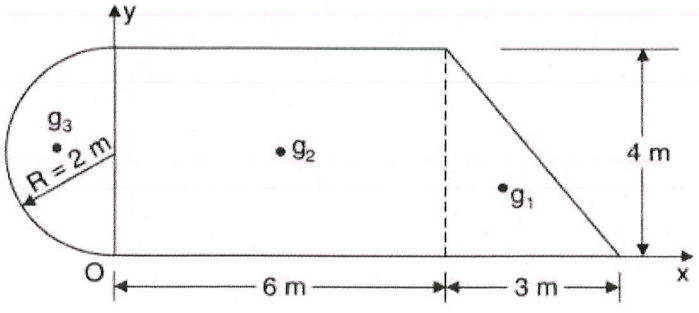
UNIT-III

5		A semicircle of 90 mm radius is cut out from a trapezium as shown in Fig. Find the position of the centre of gravity of the figure.	L4	12M



OR

6		Determine the centroid of the area shown in Fig. with respect to the axis shown	L1	12M

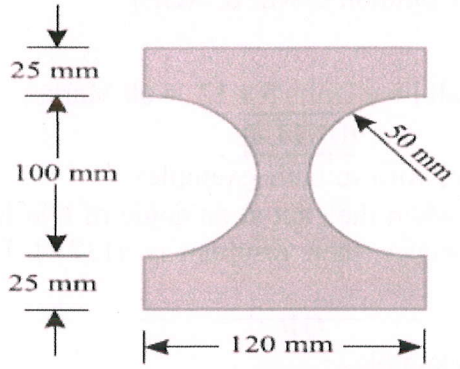


UNIT-IV

7 Derive an equation for moment of inertia of the following sections about centroidal axis: **L4** **12M**
(i) A rectangular section, (ii) A triangular section from its base

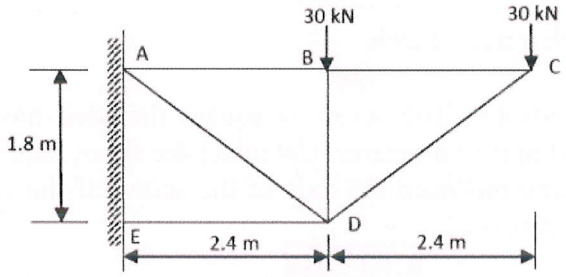
OR

8 Figure shows the cross-section of a cast iron beam. Determine the moments of inertia of the section about horizontal and vertical axes passing through the centroid of the section. **L2** **12M**



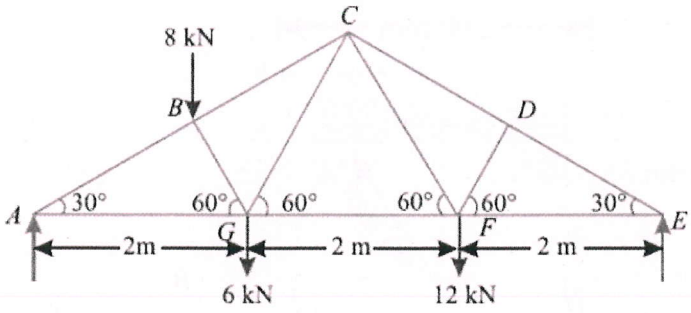
UNIT-V

9 Find the forces in the members of a truss as shown in fig. **L1** **12M**



OR

10 An inclined truss loaded as shown in fig. **L4** **12M**



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