Q.P. Code: 18CE0101 **R18**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations February-2022

ENGINEERING MECHANICS

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 60

PART-A

(Answer all the Questions **5 x 2 = 10** Marks)

1	a	Define Equilibrium and write its equations.	**2M**
	b	Explain the term Angle of Repose.	**2M**
	c	Differentiate Centroid and Centre of gravity.	**2M**
	d	State Parallel Axis Theorem.	**2M**
	e	What is a cantilever truss? How will you find out its reactions?	**2M**

PART-B

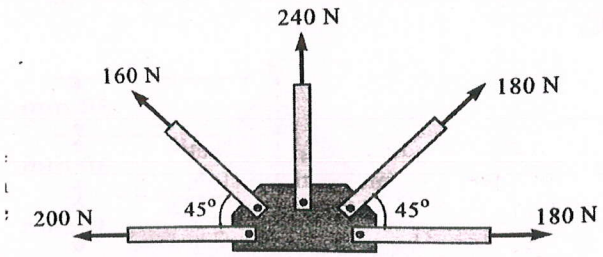
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	State and prove parallelogram law of forces.	**5M**
	b	The resultant of the two forces, when they act at an angle of 60^{o} is 14 N. If the same forces are acting at right angles, their resultant is $\sqrt{137}$ N. Determine the magnitude of the two forces.	**5M**

OR

3		A gusset plate of roof truss is subjected to forces as shown in Fig. Determine the magnitude of the resultant force and its orientation measured counter clockwise from the positive x-axis.	**10M**



UNIT-II

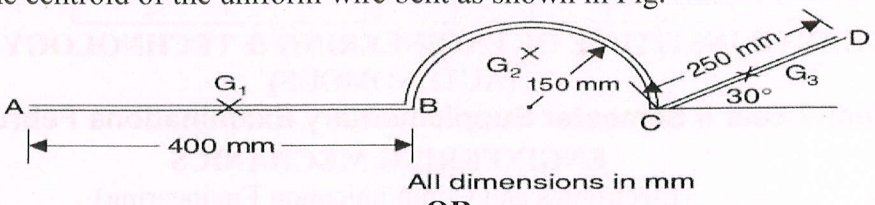
4	a	Explain Cone of Friction with a neat sketch.	**5M**
	b	Find the least force required to drag a body of weight 'W' placed on a rough inclined plane having inclination 'α' to the horizontal. The force is applied to the body in such a way that it makes an angle 'Θ' to the inclined plane and the body is on the point of motion up the plane.	**5M**

OR

5		A ladder 5 meters long rests on a horizontal ground and leans against a smooth vertical wall at an angle 70° with the horizontal. The weight of the ladder is 900 N and acts at its middle. The ladder is at the point of sliding, when a man weighing 750 N stands on a rung 1.5 meter from the bottom of the ladder. Calculate the coefficient of friction between the ladder and the floor.	**10M**

UNIT-III

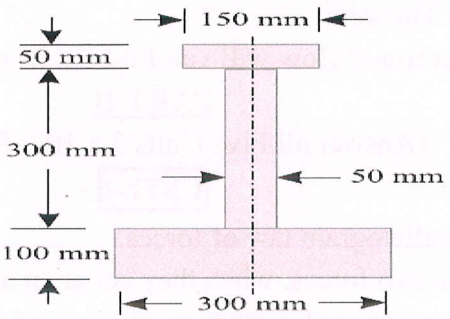
6 Locate the centroid of the uniform wire bent as shown in Fig. **10M**



OR

7 An I-section as shown in Fig. has the following dimensions in mm units: **10M**

Bottom flange = 300 × 100
Top flange = 150 × 50
Web = 300 × 50
Determine mathematically the position of center of gravity of the section.

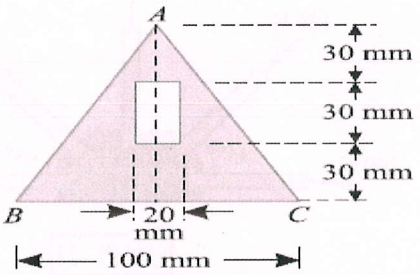


UNIT-IV

8 Prove the parallel axis theorem in the determination of moment of inertia of areas with the help of a neat sketch. **10M**

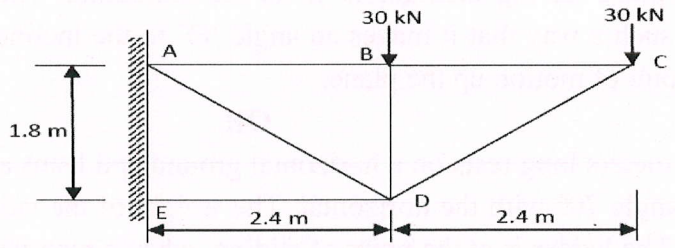
OR

9 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 center of gravity and the base BC. **10M**



UNIT-V

10 Find the forces in the members of a truss as shown in fig. **10M**



OR

11 Explain the procedure to find forces in members of truss by using method of sections. **10M**

END