Q.P.Code: 18CE0101	R18	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations June-2024

ENGINEERING MECHANICS

(Civil Engineering)

Time: 3 Hours **Max. Marks: 60**

PART-A

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

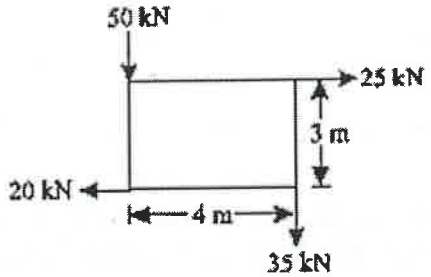
1	a	Write down the Applications of Forces.	CO1	L2	2M
	b	Limiting Force of Friction	CO2	L1	2M
	c	Parallel Axis Theorem	CO3	L1	2M
	d	Polar Moment of Inertia	CO4	L2	2M
	e	State the assumptions made in the analysis of pin jointed trusses.	CO5	L1	2M

PART-B

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

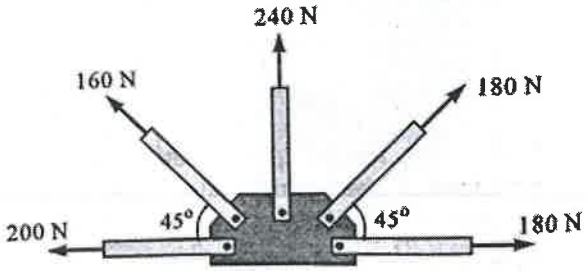
UNIT-I

2	a	State and prove parallelogram law of forces.	CO1	L1	5M
	b	A system of forces are acting at the corners of a rectangular block as shown in Fig. Determine the magnitude and direction of the resultant force.	CO1	L2	5M



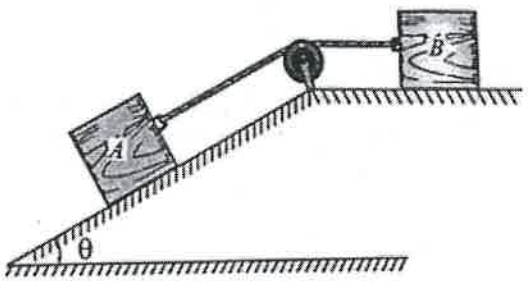
OR

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.	CO1	L4	10M



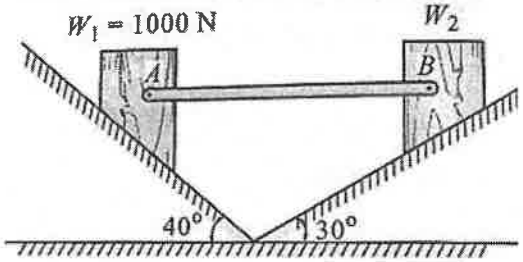
UNIT-II

4		Find the value of 'Θ' if the block 'A' and 'B' shown in Fig. have impending motion. Given block A = 20 kg, block B = 20 kg, $\mu_A=\mu_B=0.25$.	CO2	L4	10M



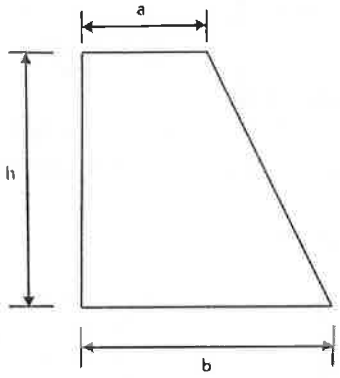
OR

5	Two blocks W1 and W2 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.	CO2	L4	10M



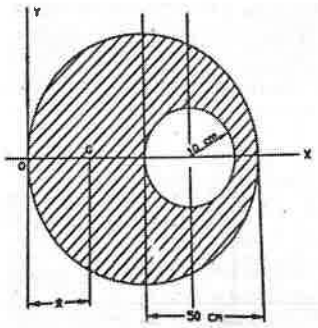
UNIT-III

6	Find the centroid of the section of a masonry dam as shown in the Fig.	CO3	L6	10M



OR

7	Determine the centroid of the remaining portion of a circular sheet of metal of radius 50cm when a hole of 10cm radius is taken out from the Centre of the circular disc along its horizontal diameter as shown in fig.	CO3	L4	10M

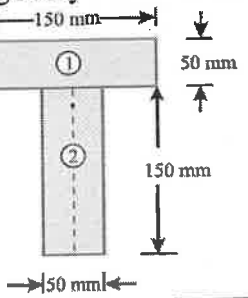


UNIT-IV

8	Derive an equation for moment of inertia of the following sections about centroidal axis: (a) A rectangular section; (b) A triangular section from its base	CO4	L3	10M

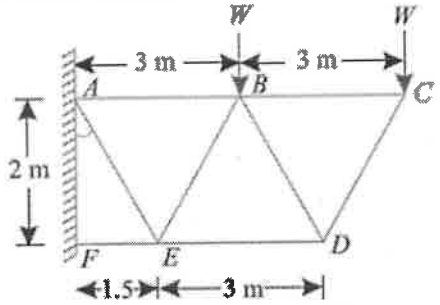
OR

9	Find the moment of inertia of a T-section with flange as 150mm×50mm and web as 150mm × 50 mm about X-X and Y-Y axes through the center of gravity of the section as shown in fig.	CO4	L5	10M



UNIT-V

10	A cantilever truss is loaded as shown in Fig. Find the value W, which would produce the force of magnitude 15 kN in the member AB.	CO5	L6	10M



OR

11	Explain the procedure to find forces in members of truss by using method of joints.	CO5	L2	10M

***** END *****