VIT
Vellore Institute of Technology

SCHOOL OF MECHANICAL ENGINEERING

Continuous Assessment Test–II - Fall Semester 2019-2020

Programme Name & Branch: B Tech-Mechanical Engineering

Course Name & Code: MEE 1002 Engineering Mechanics

Class Number: VL2019201002228/ VL2019201001155 **Slot:** B2/TB2/V4

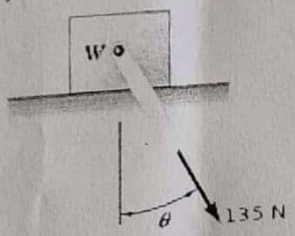
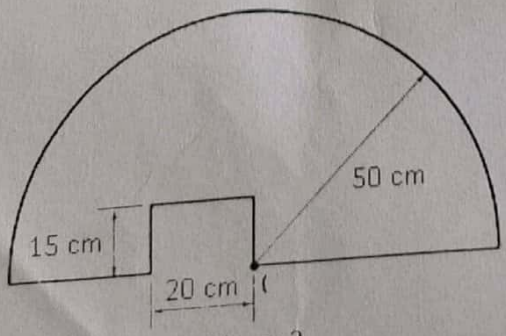
Exam Duration: 90 Minutes **Maximum Marks:** 50

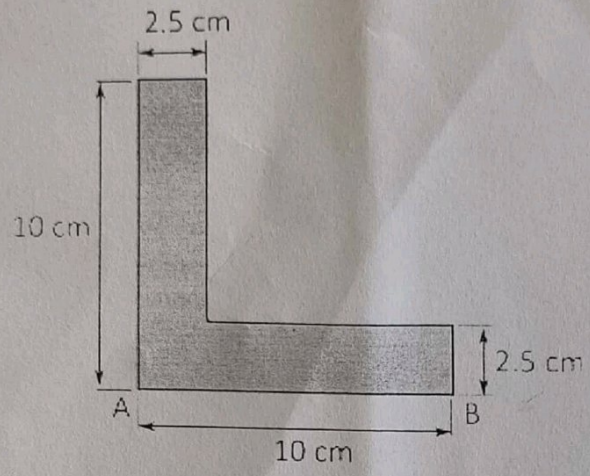
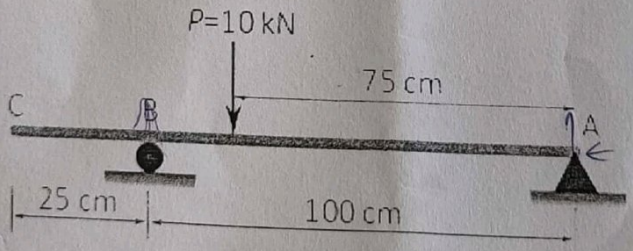
General instruction(s):

No printed/photocopied materials are permitted.

Answer all questions

Section – A (2x10 = 20 Marks)

Sl.No.	Question	Course Outcome (CO)
1.	Considering only values of θ less than 90^0, determine the smallest value of θ required to start the block moving to the right (see Fig. 1) when (*a*) W = 300 N, (*b*) W = 450 N. Take $\mu_s = 0.25$ and $\mu_k = 0.2$.  Figure 1	CO 3
2.	Find the centroid of the area shown in Fig. 2 (C is the centre of the semicircle of radius 50 cm).  Figure 2	CO 4

Section – B (2x15 = 30 Marks)		
Sl.No.	**Question**	**Course Outcome (CO)**
3.	Determine the moments of inertia $\bar{I}_x$ and $\bar{I}_y$ of the area shown in Fig. 3 with respect to centroidal axes, respectively parallel and perpendicular to side *AB*.  Figure 3	CO 4
4.	(a) Discuss the principle of virtual work with the help of an example. (b) Find the reaction at the end B of a beam shown in Fig. 4 using the principle of virtual work.  Figure 4	CO 5