PRESIDENCY UNIVERSITY

BENGALURU

Make Up Examinations – December 2025

Date: 26 – 12- 2025   **Time:** 1.00pm to 04.00pm

School: SOE	**Program:** B .Tech
Course Code : CIV1003	**Course Name**: Elements of Engineering Mechanics

Semester: MK	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5
Marks	26	48	26	-	-

Instructions:

(i) *Read all questions carefully and answer accordingly.*

(ii) *Do not write anything on the question paper other than roll number.*

Part A

Answer ALL the Questions. Each question carries 2marks.   **10Q x 2M=20M**

1.	List the Characteristics of a Force.	2 Marks	L1	CO1
2.	Define a Concurrent force system with an example.	2 Marks	L1	CO1
3.	State the Principle of Superposition of Forces.	2 Marks	L1	CO1
4.	Tell the formula for Lami's Theorem.	2 Marks	L1	CO2
5.	List the different types of supports.	2 Marks	L1	CO2
6.	Describe a Uniformly distributed load with figure.	2 Marks	L1	CO2
7.	Describe a Cantilever beam with a figure.	2 Marks	L1	CO2
8.	Reproduce any two laws of Friction.	2 Marks	L1	CO3
9.	Define Angle of Repose. Write the relation between Angle of Repose and Angle of Friction.	2 Marks	L1	CO3

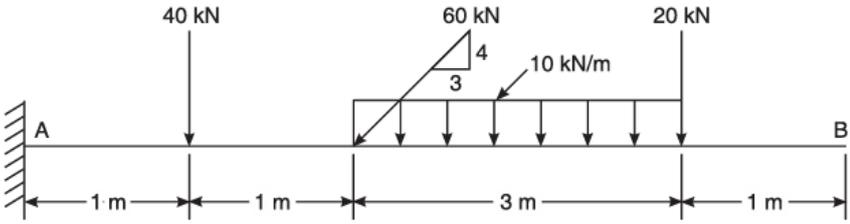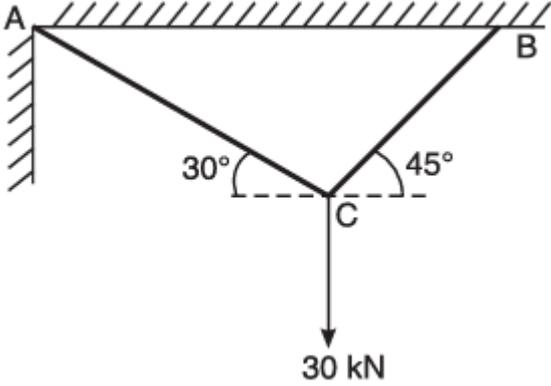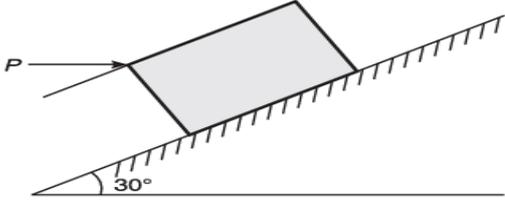| 10.	List the Centroids of the below given figure with respect to X and Y axis:	2 Marks	L1	CO3

Part B

Answer the Questions.   **Total Marks 80M**

11.	a.	Locate the Resultant of the given system of forces as shown in Fig 11.1.	15 Marks	L2	CO1

Fig 11.1

	b.	Also, compute the direction at which the resultant is applied in the figure.	5 Marks	L2	CO1

<div align="center">Or</div>

12.	a.	Locater the magnitude , direction and distance of the resultant from the point 'A' for the system of forces shown in Fig 12.1	20 Marks	L2	CO1

Fig 12.1

13.	a.	The system of connected flexible cables shown in Figure 13.1 is supporting 2 loads of 400 N and 500 N at points B and D, respectively. Determine the tensions in the various segments of the cable.	10 Marks	L2	CO2
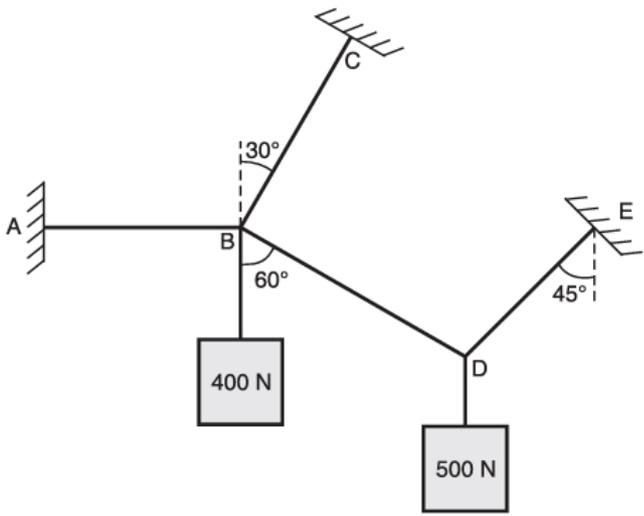
Fig 13.1

	b.	Compute the support reactions for the beam loaded and supported as shown in Figure 13.2	10 Marks	L2	CO2
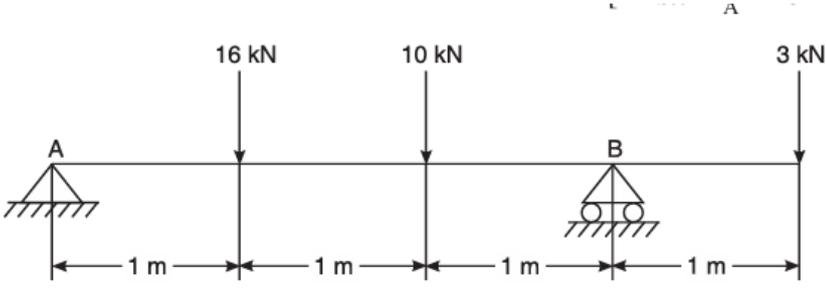
Fig 13.2

Or

14.	a.	Compute the support reactions for the cantilever beam shown in Figure 14.1	10 Marks	L2	CO2

Fig 14.1

	b.	Two cables are connected at A and B as shown in Figure 14.2. A force of 30 kN is applied at C. Determine the forces in the cables CA and CB.	10 Marks	L2	CO2

Fig 14.2

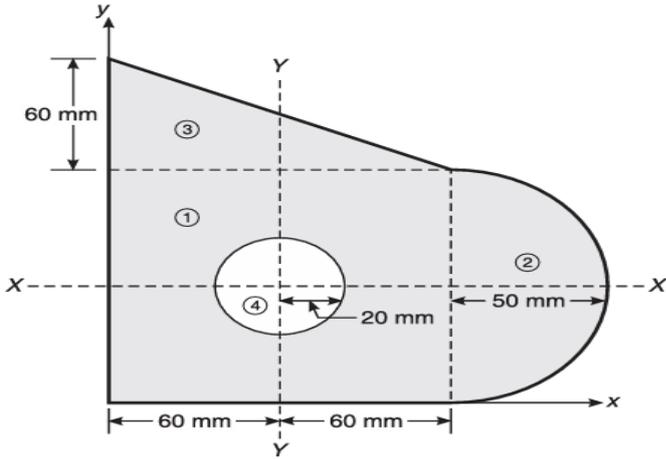| 15.	a.	A small block of weight 1000 N as shown in Figure 15.1, is placed on a 30° inclined plane with μ= 0.25. Determine the horizontal force to be applied for: **(i)** Impending motion down the plane **(ii)** Impending motion up the plane	20 Marks	L2	CO3

Fig 15.1

Or

16.	a.	Locate the position of the centroid for the lamina with a circular cut-out shown in Fig 16.1	20 Marks	L2	CO3

		Fig 16.1			

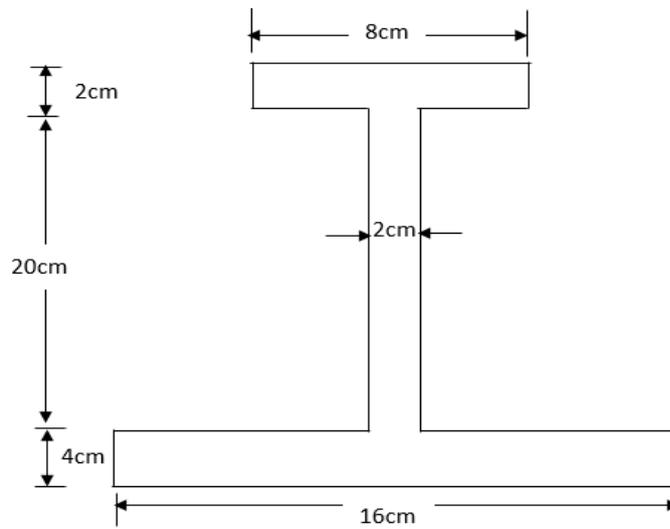| 17.	a.	Compute the Moment of Inertia of the given section about its centroidal axis.	20 Marks	L2	CO3

Fig 17.1

Or

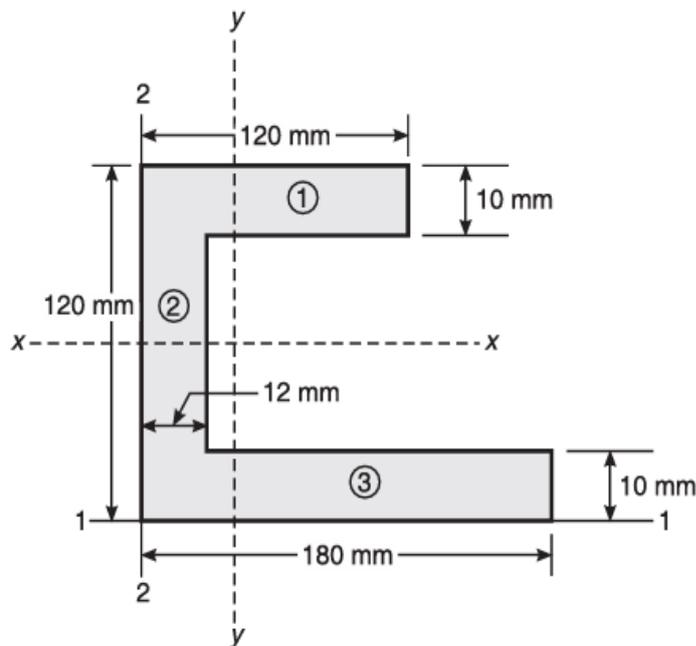| 18.	a.	Compute the Moment of inertia of the section, shown in Figure 18.1, about its centroidal axes.	20 Marks	L2	CO3

Fig 18.1