

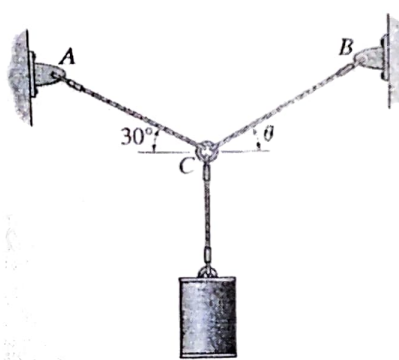
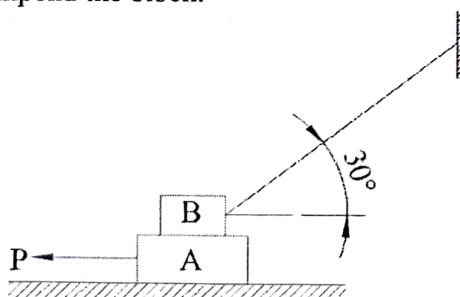
JAMIA HAMDARD
Department of Computer Science & Engineering
School of Engineering Science & Technology
B.Tech(CSE/ECE)
Even Semester Examination 2023
Course Code- BTCSE/BTECE -210
Course Title – Basic Engineering Mechanics

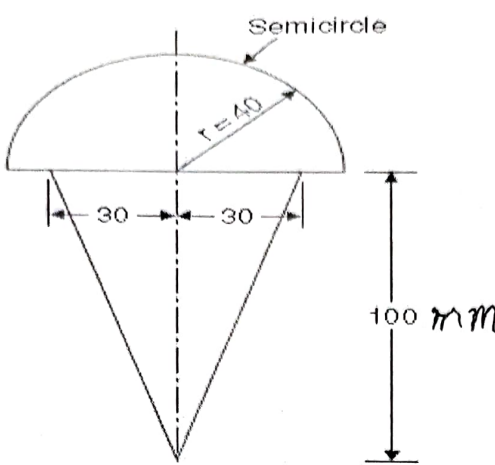
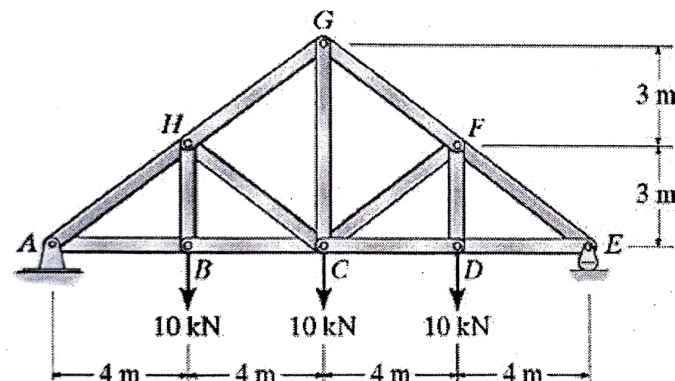
Roll No-

Time: 2.5 Hours

Max. Marks: 60

- Note:*
1. Answer all questions from Section A. Limit your answers to 20-40 words in this part.
 2. Answer any **four** questions from Section -B.
 3. Different parts of the same question are to be attempted adjacent to each other.
 4. A non-Programmable Calculator is allowed.

		SECTION –A (4x5 = 20 Marks)	Marks	Course Outcomes	Blooms Taxonomy Level
Q1	(a)	What are the laws of friction?	(2.5)	CO1	L1
	(b)	Define the lami's Principle.	(2.5)		L2
Q2		If cable is subjected to a tension that is twice that of cable CA as shown in figure 1, determine the angle θ for equilibrium of 100 N cylinder. Also, what are the tensions in wires CA and CB?  Figure 1	(5)	CO2	L3
Q3		Two blocks A and B of weight 4 kN and 2 kN respectively are in equilibrium position as shown in figure 2. Coefficient of friction between the two blocks as well as block and floor are 0.25. Find force P required to impend the block.  Figure 2	(5)	CO1	L3

Q4	Determine the centroid of the composite section as shown in the Fig. 3  Figure 3	(5)	CO5	L3
SECTION-B (4x10 = 40 Marks)				
Q1	Derive the expression for moment of inertia of semi-circle about its diametrical axis	(10)	CO2	L3
Q2	Find the forces in all the members of the truss shown in Fig.4. Tabulate the results.  Figure 4	(10)	CO3	L2
Q3	Derive the expression for the relationship between tight side and slack side forces in a belt friction $\frac{T_1}{T_2} = e^{\mu\theta}$	(10)	CO5	L3
Q4	The 12 m boom AB weighs 1 kN, the distance of the center of gravity G being 6 m from A. For the position shown, determine the tension T in the cable and the reaction at B [Ref. Fig. 5]	(10)	CO4	L3

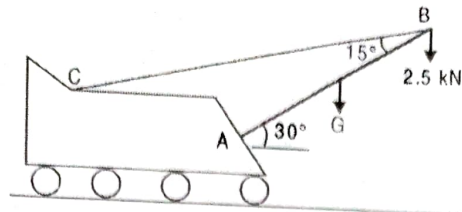


Figure 5

Q5 For the plane area shown in figure 6, determine the first moments with respect to the x and y axes and the location of the centroid.

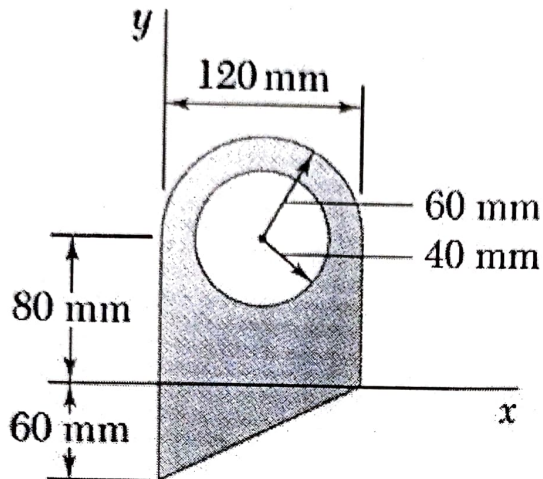


Figure 6

Q6 Determine the force in members FH , GH , and GI .

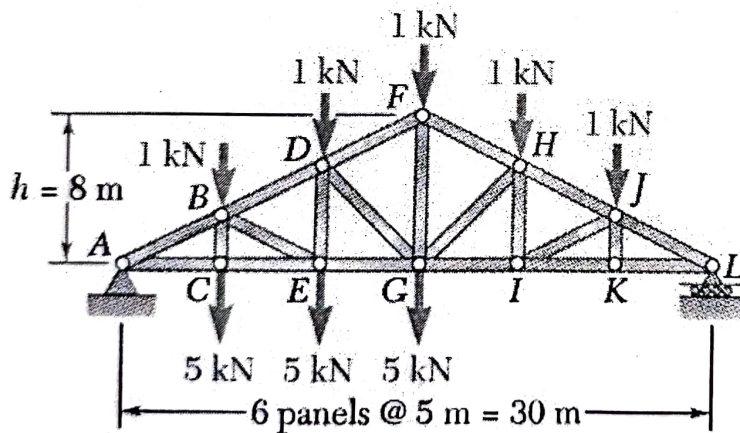


Figure 7
