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School of Engineering Science & Technology
B.Tech(CSE/ECE)

Supplementary/Improvement Exam 2024

(For Even Semester 2024)

Course Code- BTCSE/BTECE -210

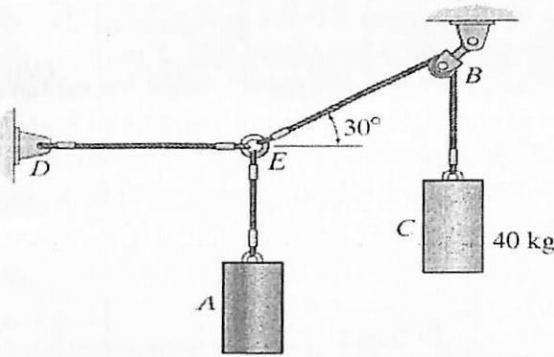
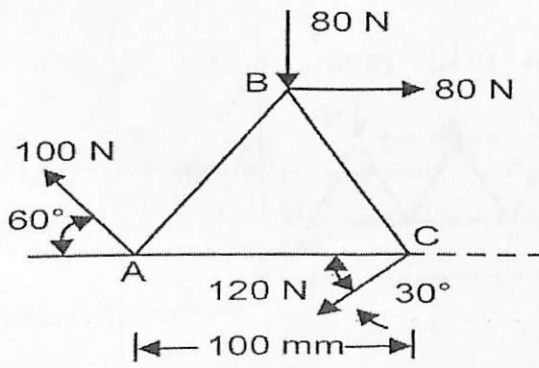
Course Title – Basic Engineering Mechanics

Roll No-

Time: 2.5 Hours

Max. Marks: 60

- Note:*
1. Answer all **four** 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.

	<u>SECTION –A (4x5 = 20 Marks)</u>	Marks	Course Outcomes	Blooms Taxonomy Level
Q1	Define Varignon's Theorem	5	CO1	L1
Q2	If the mass of cylinder C is 40 kg, determine the mass of cylinder A in order to hold the assembly in the position shown.  Figure 1	5	CO1	L3
Q3	Find the resultant of the force system shown in Fig.2 from point A acting on a lamina of equilateral triangular shape.  Figure 2	5	CO2	L3

Q4	Find the forces in all the members of the truss shown in Fig.3 Figure 3	5	CO2	L4
SECTION-B (4x10 = 40 Marks)				
Q1	Two cylinders, A of weight 4000N and B of weight 2000N rest on smooth inclines as shown in Fig. 4. They are connected by a bar of negligible weight hinged to each cylinder at its geometric Centre by smooth pins. Find the force P to be applied as shown in the figure such that it will hold the system in given position Figure 4	10	CO1	L3
Q2	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	CO4	L2
Q3	Find the magnitude and nature of the forces in the members FH, GH and GI of the loaded truss shown in Fig. 5. Figure 5	10	CO2	L4

Locate the centroid $(\bar{x}, \bar{y})$ of the shaded area as shown in Fig. 6.

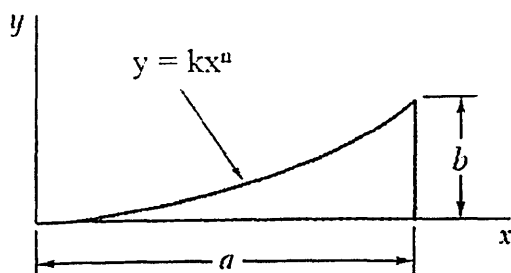


Figure 6

10

CO4

L3

Q5 Determine the moment of inertia of the shaded area with respect to the x axis

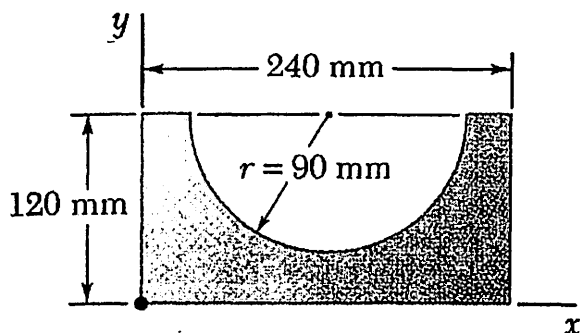


Figure 7

10

CO5

L3

Q6 A ladder of length 4m weighing 200N is placed against a vertical wall as shown in figure 8. The coefficient of friction between the wall and the ladder is 0.2 and that between the floor and the ladder is 0.3. The ladder in addition to its own weight has to support a man weighing 600N at a distance of 3m from A. Calculate the minimum horizontal force to be applied at a to prevent slipping.

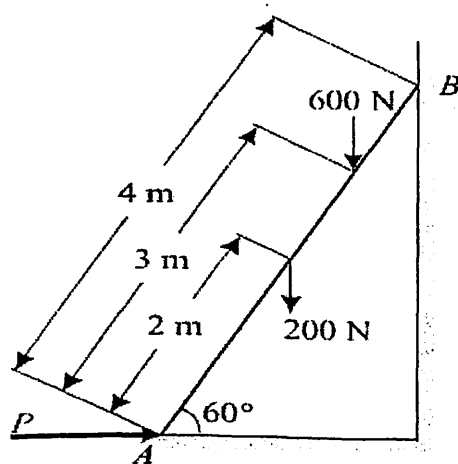


Figure 8

10

CO3

L3

BL – Bloom's Taxonomy Levels

(1- Remembering, 2- Understanding, 3- Applying, 4-Analyzing, 5- Evaluating, 6- Creating)

CO-Course Outcomes

-----End of Paper-----