MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY, BHOPAL
DEPARTMENT OF CIVIL ENGINEERING

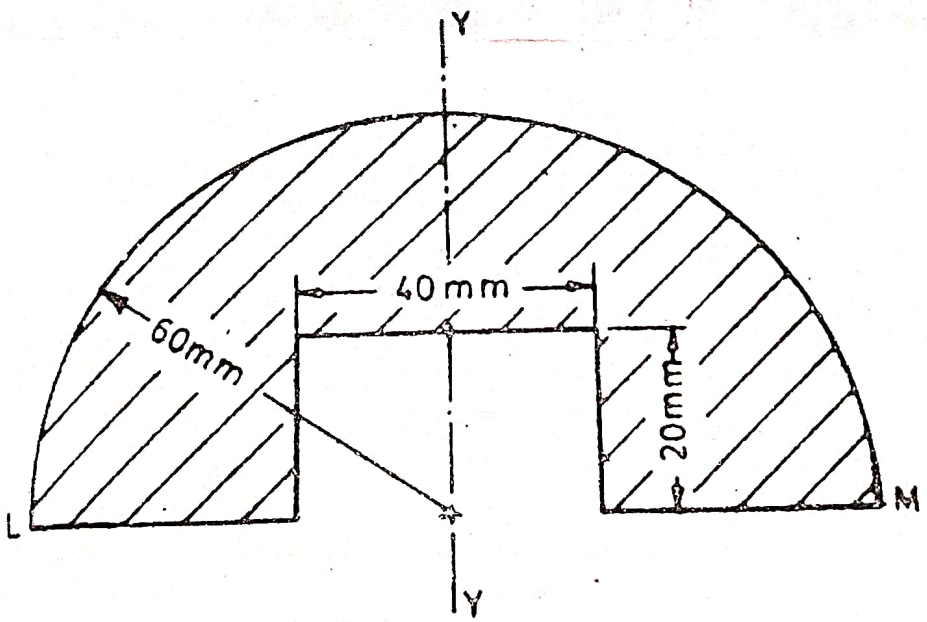
Examination: - **End Term Exam (Theory)** *Month & Year:* - **December, 2024**

Course: - **B. Tech.** *Semester:* - **I** *Branch:* - **All Branches**

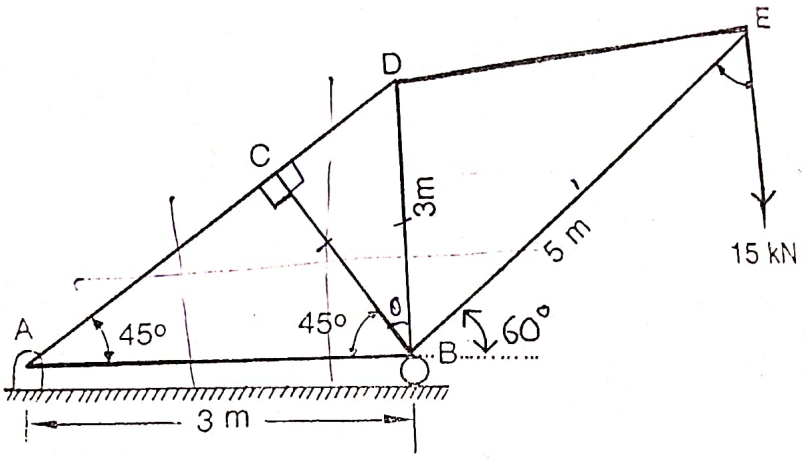
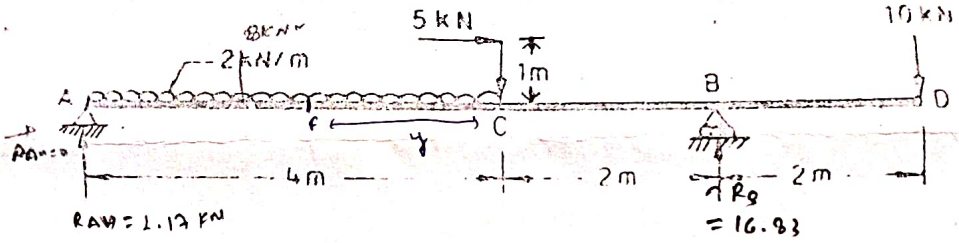
Subject Name: - **Engg. Mechanics** *Subject Code:* - **CE-24103**

Time: **2 hours** *Max. Marks:* **40**

Note: - Answer all **five** questions. Make suitable assumptions if necessary.

Q.1	a) State and prove Lami's theorem with suitable figure.	03	CO1
	b) A man and a boy carry a weight of 300 N between them by means of a uniform pole 2 m long and weighing 100 N. Where must be the weight be placed so that the men may bear twice as much of the weight as that of the boy?	05	CO2
Q.2	Determine the Moment of Inertia of the shaded area as shown in figure about horizontal centroidal axis. 	08	CO3

P.T.O.....

Q.3	A truss with A as Hinged and B as Roller supported supports is loaded with a vertical load of 15 KN at E, as shown in figure. Find out the magnitude & nature of forces in the members BC, BD and BE of the truss by using Method of Sections only and tabulate the results.  	08	CO4
Q.4	Draw Shear Force Diagram & Bending Moment Diagram for the beam loaded as shown in figure. Also locate the point of contraflexure if any.  	08	CO5
Q.5	a) Differentiate between Angle of Friction and Angle of Repose with suitable sketches. b) A ladder 5 m long and of 250 N weight is placed against the vertical wall in a position where its inclination to the vertical is 30^0. A man weighting 800 N climbs the ladder. At what position will he induce slipping? The coefficient of friction for both the contact surfaces of the ladder, viz., with the wall and the floor is 0.2.	03 05	CO6 CO6