Code No.: ME208ES | R20 | H.T.No. | | | 8 | R | | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
I–B.TECH–II–Semester End Examinations (Supply) - March- 2023
ENGINEERING MECHANICS
(MECH)

[Time: 3 Hours] **[Max. Marks: 70]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(20 Marks)**

1.	a)	Define the term moment of a force.	[2M]
	b)	Define free body diagram.	[2M]
	c)	List-out the types of friction.	[2M]
	d)	What is the difference between the centroid and center of gravity?	[2M]
	e)	Define the perpendicular axis theorem.	[2M]
	f)	Identify the coordinates of centroid for the rectangle.	[2M]
	g)	Write the four basic relations of rectilinear motion of a particle.	[2M]
	h)	Differentiate between kinematics and kinetics.	[2M]
	i)	Explain the principle of conservation of energy.	[2M]
	j)	Explain instantaneous center of rotation.	[2M]

PART-B **(50 Marks)**

2.		Explain the system of forces with neat sketches.	[10M]
		OR	
3.		State and prove the Lami's theorem.	[10M]
4.		Explain the following terms.	[5M]
	a)	Coefficient of friction.	[5M]
	b)	Angle of friction.	
		OR	
5.		Find the centroid of plane lamina shown in Fig.1	[10M]

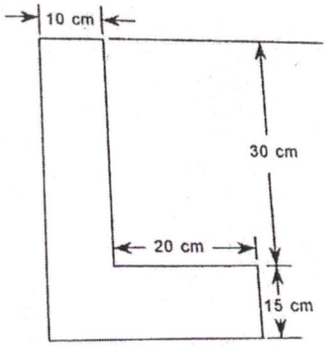

Fig.1

6. State and Derive the parallel axis theorem with neat sketches. [10M]

OR

7. Find the moment of inertia about XX and YY axes for the following Fig.2 [10M]

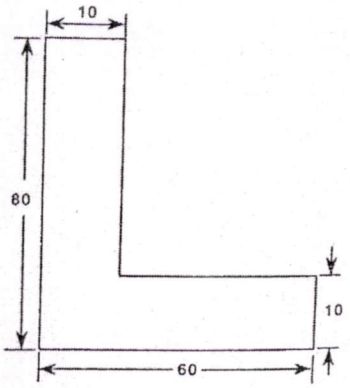

Fig.2

(All Dimensions are in mm)

8. Derive a relation for the distance travelled in n^{th} second of a particle. [10M]

OR

9. Derive work-energy equation for translation. [10M]

10. Explain D'Alembert's principle with the help of neat sketch. [10M]

OR

11. Write about the kinetic energy and potential energy. [10M]

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