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Course Code: 1920301 **Roll No:** **MLRS- R19**

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

I B.TECH II Sem Supplementary Examination, December-2021

ENGINEERING MECHANICS

(CE, ME)

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

Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. In Part – B, answer any one question from each unit.
Each question carries 10 marks and may have a, b as sub questions.

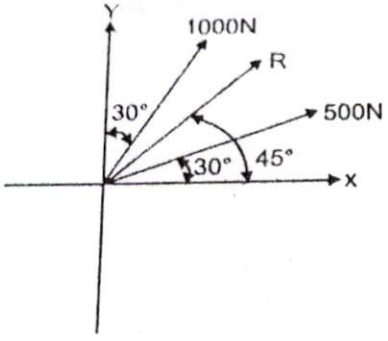
PART- A

(10*2 Marks = 20 Marks)

1.	a)	Define Parallelogram law of forces ?	2M	CO1	BL1
	b)	What is meant by the system of forces?	2M	CO1	BL1
	c)	List any two laws of friction?	2M	CO2	BL1
	d)	What is meant by angle of repose?	2M	CO2	BL1
	e)	Define the term radius of gyration?	2M	CO3	BL1
	f)	Write the expression for perpendicular axis theorem?	2M	CO3	BL1
	g)	Differentiate between acceleration and retardation?	2M	CO4	BL3
	h)	Define the term curvilinear motion?	2M	CO4	BL1
	i)	What is the difference between velocity of projection and angle of projection?	2M	CO5	BL2
	j)	Define the term energy and given its units?	2M	CO5	BL1

PART- B

(10*5 Marks = 50 Marks)

2		Two forces actin on a body are 500N and 1000N as shown in Fig. Determine the third force R such that the resultant of the two forces is 45^0 to x axis. 	10M	CO1	BL3

OR

3		How do you classify the force system? Explain each of them	10M	CO1	BL

4	a)	Explain the working of simple screw jack?	5M	CO2	BL1
	b)	Find the horizontal force required to drag a body of weight 100 N along a horizonal plane. If the plane, when gradually raised up to 15^0, the body will begin to slide.	5M	CO2	BL4
		OR			
5		Explain about the how do you find the centroid of a rectangular section with neat sketch?	10M	CO2	BL2
6	a)	Explain the terms centroid and moment of inertia of a body?	5M	CO3	BL2
	b)	Explain about the parallel and perpendicular axis theorem?	5M	CO3	BL2
		OR			
7		How do you find the moment of inertia of a composite sections ? Explain step by step procedure adopted?	10M	CO3	BL2
8	a)	Write the impulse-momentum equation and mention its application	5M	CO4	BL1
	b)	Discuss on the rectilinear and curvilinear motion of the particle?	5M	CO4	BL2
		OR			
9		Briefly explain the following terms (i) Bodies in rectilinear translation (ii) Bodies in curvilinear translation (iii) Bodies rotating about fixed axis and (iv) Bodies in plane motion	10M	CO4	BL2
10	a)	What is work-energy principle for rotation bodies?	5M	CO5	BL1
	b)	A train of weight 2000 kN is ascending a slope of 1 in 200 with a uniform velocity of 40 km/hr. Find the power exerted by the engine if the track resistance is 10 N/kN of the weight of train.	5M	CO5	BL2
		OR			
11		A 750 N crate rests on 500 N cart. The coefficient of friction between the crate and the cart is 0.3 and the road is 0.2. If the cart is to be pulled by a force P , such that the crate does not slip, determine : (a) the maximum allowable magnitude of P and (b) the corresponding acceleration of the cart.	10M	CO5	BL3

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