


**MARRI LAXMAN REDDY  
INSTITUTE OF TECHNOLOGY AND MANAGEMENT**

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi &amp; Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade &amp; Recognized Under Section 2(f) &amp; 12(B) of the UGC act, 1956

I B.Tech II Sem Regular End Examination, September 2021

**Engineering Mechanics  
(CIVIL)**
**Time: 3 Hours.****Max. Marks: 70**

Note: 1. Answer any FIVE questions.

2. Each question carries 14 marks and may have a, b as sub questions.

1	a)	Explain the system of forces?	7M	CO1	BL1
	b)	Two forces of 100 N and 150 N are acting simultaneously at a point. What is the resultant of these two forces, if the angle between them is $45^\circ$ ?	7M	CO1	BL1
2	a)	Explain the <i>Parallelogram</i> law of forces?	7M	CO1	BL1
	b)	The following forces act at a point: (i) 20N inclined at $30^\circ$ towards North of East (ii) 25N towards North (iii) 30N towards North West and (iv) 3 N inclined at $40^\circ$ towards South of West Find the magnitude and direction of the resultant force.	7M	CO1	BL3
3	a)	Explain the terms : (i) Coefficient of friction (ii) laws of friction .	7M	CO2	BL1
	b)	Describe the equilibrium of a body on a rough inclined plane.	7M	CO2	BL2
4	a)	Explain the working of simple screw jack?	7M	CO2	BL1
	b)	Find the horizontal force required to drag a body of weight 100 N along a horizontal plane. If the plane, when gradually raised up to $15^\circ$ , the body will begin to slide.	7M	CO3	BL4
5	a)	Define the centroid ? Explain briefly how do you find the centre of gravity of a plane figure.	7M	CO3	BL1
	b)	Find the centre of gravity of a 100 mm x 150 mm x 30 mm t-section.	7M	CO3	BL3
6	a)	State and prove the perpendicular axis theorem applied to moment of inertia.	7M	CO4	BL1
	b)	Find the moment of inertia of a rectangular section 30 mm wide and 40 mm deep about X-X axis and Y-Y axis.	7M	CO4	BL3

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7	a)	Describe the method of finding out the moment of inertia of a composite section.	7M	CO4	BL3
	b)	Describe the types of motion?	7M	CO5	BL2
8	a)	Explain about the D'Alembert's Principle?	7M	CO5	BL3
	b)	A machine gun of mass 25 kg fires a bullet of mass 30 grams with a velocity of 250 m/s. Find the velocity with which the machine gun will recoil.	7M	CO5	BL3

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**BL - Blooms Taxonomy Levels**

Note: 1. Font style: Cambria.

2. Bloom's Taxonomy Level (BL) shall be mentioned for each question.

G. S. Praakash  
 11/09/2021  
 Dr. G. Surya Prakash Rao  
 Mechanical Engineering