

Final: - 21-02-2022

Course Code: 1930303

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 Section 2(f) & 12(B) of the UGC act, 1956

II B.TECH I Sem Supplementary Examination, February 2022
**Engineering Mechanics
(EEE)**

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 the Newton's Law of gravitation? | 2M | CO1 | BL1 |
| b) How do you find the resultant force of the force system? | 2M | CO1 | BL3 |
| c) How do you classify the dynamic friction? | 2M | CO2 | BL1 |
| d) Define the term coefficient of friction? | 2M | CO2 | BL1 |
| e) Define the term polar moment of inertia ? | 2M | CO3 | BL1 |
| f) Write the expression for parallel axis theorem? | 2M | CO3 | BL2 |
| g) Define the term rectilinear motion? | 2M | CO4 | BL1 |
| h) What is the general principle of dynamics? | 2M | CO4 | BL2 |
| i) Describe the terms translation and rotation? | 2M | CO5 | BL1 |
| j) Work-energy approach can be used to solve | 2M | CO5 | BL3 |

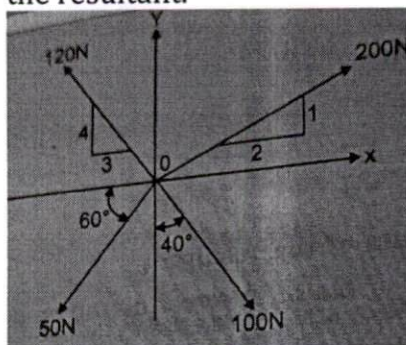
PART- B

(10*5 Marks = 50 Marks)

- | | | | |
|---|----|-----|-----|
| 2. a) Explain about the resultant force system? | 5M | CO1 | BL2 |
| b) Describe the Lami's theorem? | 5M | CO1 | BL3 |

OR

A system of four forces acting on a body is as shown in Fig. Determine the resultant.



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10M CO1 BL

- 4 a) Explain the terms : (i) Coefficient of friction (ii) laws of friction . 5M C02 BL2
 b) Describe the equilibrium of a body on a rough inclined plane. 5M C02 BL3
- OR**
- 5 A body, resting on a rough horizontal plane, required a pull of 180 N inclined at 30° to the plane just to move it. It was found that a push of 220 N inclined at 30° to the plane just moved the body. Determine the weight of the body and the coefficient of friction 10M C02 BL3
- 6 a) Describe the term area moment of inertia ? 5M C03 BL3
 b) Derive the equation for moment of inertia of a rectangular section? 5M C03 BL3
- OR**
- 7 Find the moment of inertia of symmetric I – section having the dimensions as follows. 10M C03 BL3
 Flange : 200 x 9 mm and Web : 232 x 9 mm
- 8 a) Write the impulse-momentum equation and mention its application 5M C04 BL1
 b) Discuss on the rectilinear and curvilinear motion of the particle? 5M C04 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 C04 BL2
- 10 a) State and Explain the D' Alembert's Principle? 5M C05 BL2
 b) Explain about the instantaneous centre of rotation in plane motion with suitable sketches? 5M C05 BL2
- OR**
- 11 An elevator cage of a mine shaft weighing 8Kn, when empty is lifted or lowered by means of a wire rope. Once a man weighing 600 N, entered it and lowered with uniform acceleration such that when a distance of 187.5m was covered, the velocity of the cage was 25m/sec. Determine the tension in the rope and the force exerted by the man on the floor of the cage. 10M C05 BL3

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