



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

I B.TECH II Sem Supplementary Examination, May 2022

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 the Newton's Law of gravitation. | 2M | C01 | BL1 |
| b) How do you find the resultant force of the force system? | 2M | C01 | BL1 |
| c) How do you classify the dynamic friction? | 2M | C02 | BL1 |
| d) Define the term coefficient of friction. | 2M | C02 | BL1 |
| e) Define the term polar moment of inertia. | 2M | C03 | BL1 |
| f) Write the expression for parallel axis theorem. | 2M | C03 | BL2 |
| g) Define the term rectilinear motion? | 2M | C04 | BL1 |
| h) What is the general principle of dynamics? | 2M | C04 | BL2 |
| i) Describe the terms translation and rotation. | 2M | C05 | BL1 |
| j) Work-energy approach can be used to solve. | 2M | C05 | BL3 |

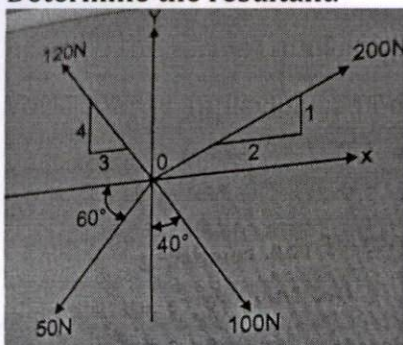
PART- B

(10*5 Marks = 50 Marks)

- | | | | |
|--|----|-----|-----|
| 2 a) Explain about the resultant force system. | 5M | C01 | BL4 |
| b) Describe the Lami's theorem. | 5M | C01 | BL2 |

OR

- | | | | | |
|---|---|-----|-----|-----|
| 3 | A system of four forces acting on a body is as shown in Fig. Determine the resultant. | 10M | C01 | BL3 |
|---|---|-----|-----|-----|



- 4 a) Explain the terms: (i) Coefficient of friction (ii) laws of friction . 5M C02 BL4
 b) Describe the equilibrium of a body on a rough inclined plane. 5M C02 BL2
- 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 BL2
 b) Derive the equation for moment of inertia of a rectangular section? 5M C03 BL6
- 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 BL4
- 10 a) State and Explain the D' Alembert's Principle? 5M C05 BL4
 b) Explain about the instantaneous centre of rotation in plane motion with suitable sketches? 5M C05 BL4
- 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

---oo0oo---