Sr. No - 013305

January 2023

B.Tech- III SEMESTER

Engineering Mechanics (ESC-203A-21)

**Time: 3 Hours** **Max. Marks:75**

***Instructions :***
1. *It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.*
2. *Answer any four questions from Part -B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*
4. *Symbols have their usual meanings.*

## PART -A

Q1 (a) Define moment. (1.5)

(b) Define spatial system. (1.5)

(c) What is limiting friction? (1.5)

(d) Define concurrent forces. (1.5)

(e) Write the uses of differential screw jack. (1.5)

(f) What is centre of gravity? (1.5)

(g) What is conservative force? (1.5)

(h) Define rectilinear motion. (1.5)

(i) State laws of friction. (1.5)

(j) What is virtual work? (1.5)

## PART -B

Q2 (a) Two concurrent 100 N forces and 50 N act on the body along directions at $0^0$ and $60^0$ to X-axis respectively. Find the magnitude and direction of the resultant. (10)

(b) Write short notes on the equilibrium of a system of forces. (5)

Q3 A body of weight W is placed on a rough inclined plane having an inclination $\propto$ to the horizontal. The force P is applied to the horizontal to drag the body. If the body is on the point of motion up the plane, prove that P is given by $P = W \tan(\propto + \emptyset)$. Where $\emptyset$ = Angle of friction. (15)

Q4 Calculate member forces in a plane truss loaded as shown below in figure: (15)