Roll No. .....

3044

B. Tech. 3rd Semester (EE) Examination – December, 2022

ENGINEERING MECHANICS

Paper : ESC-EE-202-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Section. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. Write short notes on the following : $3 \times 5 = 15$

(a) Polar moment of inertia

(b) Rolling Coin

(c) Concept of rigid body, velocity and acceleration

(d) Gyroscopic effect

(e) Coefficient of friction

SECTION – A

2. Explain Eigen values principal axis theorem in detail. 15

3. Explain Axis-angle formulation and Euler angles. 15

SECTION – B

4. Explain Newton-Euler's Law of rigid body motion in detail. 15

5. Find the Moment of inertia of a triangle about the base from first principles. 15

SECTION – C

6. Explain the General 3D motion equation in detail. 15

7. Explain modelling of typical supports and joints and discuss the kinematic and kinetic constraints they impose. 15

SECTION – D

8. Explain the relation of the Torsion of shaft with derivation. 15

9. Draw S.F.D. and B.M.D. for the cantilever beam carrying a point load at the free end. 15
