Roll No. .....

3027

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

ENGINEERING MECHANICS

Paper : PCC-CE-203-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 Unit. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. Write short notes on : $2.5 \times 6 = 15$

(a) Principal Axes.

(b) Hooke's Law.

(c) Shear Force.

(d) Strain Energy.

P. T. O.

(e) Resilience.

(f) Buckling Load.

UNIT – I

2. Explain stress strain Diagram for Ductile Materials ? Derive the relationship between elastic constant. 15

3. The principal stresses at a point across two perpendicular planes are 75MN/m^2 (tensile) and 33 MN/m^2 (tensile). Find the normal, tangential stresses and resultant stress. Its obliquity on a plane at 20° with major principal planes 15

UNIT – II

4. Draw shear force and bending moment diagram for SSB AB of span 9m carrying udl 1800 N/m run on the part CD of span so that AC = 2m, CD = 4m and BD = 3m. 15

5. Derive the Bending equation for the simple bending of a beam. List the assumption made therein. 15

UNIT – III

6. Prove that the maximum stress induced in a body due to suddenly applied load is twice the stress induced when the same load is applied gradually. 15

7. Derive the expression for critical load when both ends are fixed. 15

UNIT – IV

8. If principal stresses at a point in an elastic material are 2f tensile, f tensile, f/2 compressive, Calculate value of f according to five different theories. $\sigma yt = 200N/mm^2$, $\nu = 0.3$. 15

9. Determine the forces in all the members of Truss. 15