S. B. Roll. No.....

STRENGTH OF MATERIALS
4th Exam/Mech./Auto/2093/Jun'2021
(For 2018 Batch Onwards)

Duration: 1.15Hrs. **M.Marks:25**

SECTION-A

Q1. Attempt any three questions. **3x5=15**

i. Explain Tensile, Compressive and Shear stress.
ii. A mild steel bar of diameter 30 mm and length 2.4 m is subjected to a tensile load of 90 KN. Find the strain energy stored in the bar if the load is applied gradually. Take E = 200 GN/m^2.
iii. Explain the Theorem of perpendicular axis and parallel axis.
iv. With help of diagrams explain the concept of following end supports-Roller, hinged and fixed.
v. Explain how columns are classified.
vi. A cylindrical pressure vessel, of diameter 1 m and length 2 m, is subjected to an internal pressure of 2 MPa. If the hoop stress is limited to 42 MPa and the longitudinal stress to 28 MPa, find the minimum thickness required.
vii. Define Torque or twisting moment. Write the formula for Power transmitted by a shaft.

SECTION-B

Q2. Attempt any one question. **1x10=10**

a. Derive the Bending Equation $\frac{E}{R} = \frac{f}{y}$
b. A hollow circular column of outer diameter 100 mm and 15 mm thickness is of 8 m length. The one end of column is fixed and other end is hinged. Calculate safe compressive load with the help of Euler's formula. Factor of safety is 4 and modulus of elasticity is 96 KN/mm^2.
c. Explain the following i) Shear force ii) Bending moment iii) Point of contra flexure
d. A'T' section having size of flange 80 X 8 mm and web 80 X 8 mm. Calculate moment of inertia about centroidal axis.