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

STRENGTH OF MATERIALS
4th Exam/Mech./Auto/2093/Dec'22
(For 2018 Batch Onwards)

Duration: 3Hrs.   M.Marks:75

SECTION-A

Q1. Give one Line answer.   15x1=15
  a. What is impact load?
  b. What is stress?
  c. Write down the units of compressive stress in SI system.
  d. What is strain?
  e. Hook's Law is valid only for which materials?
  f. Where the centre of gravity of a circle is lies?
  g. What is the polar moment of Inertia of the cross section of a quarter circles?
  h. What is resilience?
  i. What is modulus of resilience?
  j. What do you mean by Centroid?
  k. What is the bending moment at the end supports of a simply supported beam?
  l. What is cantilever?
  m. What is column?
  n. What do you mean by stiffness?
  o. What is free length of a spring?

SECTION-B

Q2. Attempt any six questions.   6x5=30
   i.   An axial pull of 60kN is applied to a bar of length 4m and diameter 40mm. Determine stress
   ii. Define the following: a) Shear stress b) Compressive Strain   c) Hook's law.
   iii. What is moment of Inertia?
   iv. State assumption made in the theory of simple bending.
   v.   Write down the moment of inertia for following geometric shapes:
        a) Rectangle   b) Triangle   c) Circle   d) Quarter   e) Semi-circle
   vi. Define the following   a) Shear force   b) Bending moment   c) Point of contra flexure.
   vii. Define the following terms:
        a) Buckling Factor   b) Safe load   c) Critical load

SECTION-C

Q3. Attempt any three questions.   3x10=30
  a. Calculate the stress in steel rod if it has extension of 0.2% of length. Young's modulus for steel is 2×10^5 N/mm^2.
  b. A cantilever 6 metre long carries load of 6,8 and 10 kN at a distance of 2,5 and 6 metres respectively from its fixed end. Draw the shear force and bending moment diagram.
  c. What are the assumptions made while deriving the torsion equation?
  d. A closed coil helical spring is to carry a load of 200N. The mean coil radius is 30mm. If the maximum shear stress induced is 80 N/mm^2. Calculate the diameter of wire of which spring is formed.