Registration No:

M.TECH

Total Number of Pages :1

M.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2018
ELASTIC STABILITY AND BEHAVIOR OF METAL STRUCTURES
Branch: SE, Subject Code:MSEPC1020
(Regulations 2018)

Time: 3 Hours   **Max Marks : 70**   **Question Code: RD18002031**

PART-A (10 X 2=20 Marks)

1. Answer the following questions.

   a. Differentiate between yield load and ultimate load.
   b. What do you mean by plastic hinge?
   c. Define form factor.
   d. Differentiate between lower bound and upper bound theorem.
   e. Find the shape factor of a rectangular section of width 'b' and depth d'.
   f. Define critical stress.
   g. State the advantage of applying trigonometric series on the study of deflection curve.
   h. What do you mean by plastic section modulus?
   i. What do you mean by stability behavior of metal structure?
   j. Define rigid structure.

PART-B (5 X 10=50 Marks)
Answer any five questions from the following.

2. a) For beam column of length 'l' carrying a single lateral load Q at a distance c from right end and applied with an axial force P, derive the deflection curve equation.   [5]
   b) Derive the general equation for lateral buckling of cantilever beam.   [5]

3. a) Derive the deflection equation for beam-column with continuous lateral load.   [5]
   b) Describe the non-uniform torsion of thin walled bar of open cross section.   [5]

4. a) Find the ultimate load for a propped cantilever beam of span l subjected to udl of w/m.   [5]
   b) A slender vertical column is built at both the ends. Derive the expression for critical load.   [5]

5. a) Derive the fourth order differential equation for bending of plates by distributed lateral load 'q' over the entire surface of plate.   [5]
   b) Discuss on continuous torsional and flexural buckling of bar.   [5]

6. a) Derive the differential equation for lateral buckling of beams.   [5]
   b) Find the shape factor for thin hollow rhombus.   [5]

7. a) What is meant by warping function? Derive the expression for warping displacement for channel section.   [5]
   b) Derive the equation for bending of plate subjected to distributed load perpendicular to middle plane of plate.   [5]

8. Write Short notes on any two of the following
   a) Plastic analysis of frame   [5]
   b) Critical load   [5]

==0==