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M.TECH

Total Number of Pages :1

M.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2018
THEORY OF ELASTICITY AND PLASTICITY

Branch: SE, Subject Code:MSEPC1010

(Regulations 2018)

Time: 3 Hours

Max Marks : 70

Question Code: RD18002005

PART-A (10 X 2=20 Marks)

1. Answer the following questions.

- Differentiate between plane stress and plain strain with examples.
- What the assumptions made in yield line theory?
- Write the equation for calculating the slope and deflection of an infinite beam subjected to single concentrated load.
- What is the necessity of boundary condition in solving a problem in elasticity?
- What is membrane analogy?
- What is the utility of polar coordinate?
- Write the constitutive relationship for plane stress condition.
- Draw the three dimension body showing all components of stress.
- Differentiate between anisotropic and orthotropic material.
- Differentiate between surface force and body force with examples

PART-B (5 X 10=50 Marks)

Answer any five questions from the following.

- Derive the stress distribution in an elliptical cross section. [5]
 - Discuss various theories of failure. [5]
- Explain Prandtl stress Reuss- strain relationship. [5]
 - Derive two dimensional problem in Cartesian coordinates. [5]
- Derive the horizontal and vertical components of deflection of a cantilever beam loaded uniformly throughout its length [5]
 - Compare the yield criteria of Tresca and Von Mises. [5]
- Derive the expression for deflection curve for a cantilever loaded at free end. [5]
 - Explain boundary value problem. [5]
- Using suitable stress function, derive the displacements for cantilever beam loaded at free end [5]
 - Derive stresses for above beam. [5]
- Discuss in detail about the various failure in theories of plasticity with its limitations. [5]
 - Derive the expression showing plastic stress strain relationship. [5]
- Write a short notes on
 - Plastic flow [5]
 - Stress function [5]