GIET MAIN CAMPUS AUTONOMOUS,
GUNUPUR - 765022

Registration No: | | | | | | | | | | | **M.TECH**

Total Number of Pages : 1

M.TECH 1ST SEMESTER SUPPLE EXAMINATIONS, DECEMBER 2018

THEORY OF ELASTICITY AND PLASTICITY

Branch: SE, Subject Code:MSEPC1010

(Regulations 2017)

Time: 3 Hours **Max Marks : 70** **Question Code: SD18002007**

PART-A (10 X 2=20 Marks)

1. Answer the following questions.
   a. Differentiate between surface force and body force. Give examples.
   b. Write the equations of equilibrium and compatibility for three dimensional elastic bodies.
   c. What do you mean by complimentary stresses?
   d. What are the conditions of compatibility?
   e. What do you mean by profile section?
   f. What is membrane analogy?
   g. What is plane strain condition?
   h. Write Hooke's law in three dimensions.
   i. Draw the failure envelope for maximum shear stress theory.
   j. Name two theories that are best suited for ductile materials.

PART-B (5 X 10=50 Marks)

Answer any five questions from the following.

2(a) Derive the compatibility equation for three dimensional elastic bodies in terms of stresses. [5]

(b) Derive the stress distribution in an elliptical cross section. [5]

3(a) Derive the differential equation of equilibrium for an element in two dimensional polar co-ordinate. [5]

(b) Derive the shape factor for I section. [5]

4 (a) Explain Principal stress theory. [5]

(b) Develop the differential equation of equilibrium in three dimension of a rectangular element. [5]

5(a) Derive the constitutive relationship for stress-strain for an isotropic material in three dimensions. [5]

(b) Derive the stress distribution in a thick cylinder by using elasticity. [5]

6(a) Derive the expression for three components of stress parallel to three coordinate axes and the orientation of principal plane. [5]

(b) Describe stress function and investigate the state of stress in a rectangular plate with slides parallel to coordinate axes. [5]

7(a) Derive the equation of equilibrium in radial direction in two dimension form for elastic body in polar coordinates. [5]

(b) Derive stress function in terms of x and y in absence of body force. [5]

8. Write Short notes on any two of the following

(a) Boundary Value problem [5]

(b) Shape function [5]

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