GIET UNIVERSITY, GUNUPUR – 765022

RD19MTECH018

Registration No: | | | | | | | | | | |

Total Number of Pages : 01 M.TECH

AR-19

M.TECH 1ST SEMESTER EXAMINATIONS NOV/DEC 2019

Branch: SE, MPCSE1010

THEORY OF ELASTICITY AND PLASTICITY

Time: 3 Hours Max Marks : 70

The figures in the right hand margin indicate marks.

PART-A (10 X 2=20 MARKS)

1. Answer the following questions.
   (a) List out the assumptions of linear elasticity
   (b) Define Cauchy stress principle
   (c) What do you mean by pure bending
   (d) What is membrane analogy?
   (e) What do you mean by torsional rigidity?
   (f) What do you mean by shape function?
   (g) State the use of stress function.
   (h) Write short notes on prandtl's membrane analogy.
   (i) State maximum principle stress theory.
   (j) Define stress concentration factor

PART-B (5 X 10=50 MARKS)

Answer any five questions from the following.

2. (a) Compose the compatibility equation in 3-D Cartesian co-ordinates.
   (b) Differentiate between anisotropic and orthotropic materials. .

3. (a) Find the expression for the normal and shear for a circular disc subjected to compression along
   (b) Using Fourier Integral method, determine the solution of biharmoic equation in Cartesian Coordinates

4. (a) Illustrate the airy's stress function by direct method
   (b) Derive the two dimensional biharmonic equations in polar coordinates

5. (a) Derive Maxwell stress functions.
   (b) State the theories of failure with examples.

6. (a) Derive compatibility condition in terms of stress for two dimension element in polar Coordinate.
   (b) Derive the constitutive relationship for stress-strain for an isotropic material in three dimensions.

7. (a) State principle of superposition with examples.
   (b) Illustrate the concept of membrane analogy with case study.

8. Write Short notes on any
   (a) Flow rule
   (b) Characteristic of slip line

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