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Total Number of Pages : 01

M.TECH

M.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2017

THEORY OF ELASTICITY AND PLASTICITY

Branch: SE, Subject Code:MSEPC1010

Time: 3 Hours

Max Marks : 70

The figures in the right hand margin indicate marks.

PART-A**(10X 2=20 MARKS)****1. Answer the following questions**

- Differentiate between plane stress and plain strain with examples.
- What is the utility of polar coordinates?
- What is membrane analogy?
- What do you mean by stress function and why it is used?
- Explain Flow rule.
- What is stress Sensor?
- State maximum strain energy theory.
- Define shape factor.
- What do you mean by pure bending?
- Explain Saint Venant's principle.

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

- Derive the compatibility equation in terms of stress for plane strain problem in presence of body force components X, Y along x and y direction.
 - What is the condition of compatibility?
- Derive the expression for deflection curve for a cantilever loaded at free end.
 - Explain boundary value problem.
- Derive the stress distribution in an elliptical cross section.
 - Discuss various theories of failure.
- Compare the yield criteria for Tresca and Von Mises.
 - Explain maximum strain energy theorem with neat sketch.
- Differentiate between anisotropic and orthotropic materials.
 - Differentiate between surface force and body force with examples.
- Derive the stress distribution in a thick cylinder by using elasticity.
 - Draw three dimensional body showing all components of stress.
- Write short notes on:
 - Stress function
 - Prandl Reuss stress-strain relationship.