Reg. No										

AY 24

GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

M.Tech. (First Semester) Regular Examinations, February – 2025

24MSEPC11001 – Theory of Elasticity and Plasticity

(Structural Engineering)

Time: 3 hrs | Maximum: 60 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. Define spherical and deviator stress tensor.	CO2	L2
b. State generalized Hooke's law.	CO3	L2
c. Discuss Lami's constants.	CO1	L1
d. State the relation between stress and strain.	CO1	L2
e. Define membrane analogy.	CO3	L2

PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** the questions	Marks	CO #	Blooms Level
2. a. Derive the stress distribution in a thick cylinder by using elasticity.	5	CO2	L3
b. Construct three dimensional bodies showing all components of stress	5	CO2	L3
(OR)			
c. Explain the conditions of compatibility.	5	CO1	L2
d. Illustrate a short note on Boundary Value problem	5	CO1	L3
3.a. Explain about the reduction of elastic constants for homogeneous and isotropic materials	5	CO3	L3
b. Illustrate the differential equation of equilibrium in 3-D rectangular co-ordinates	5	CO3	L3
(OR)			
c. Compare surface force and body force with examples.	5	CO1	L3
d. Determine the solution of Biharmonic equation in Cartesian Coordinates using Fourier Integral method.	5	CO4	L3
4.a. Illustrate the airy's stress function by direct method.	5	CO1	L2
b. Illustrate a short note on Maximum Strain Energy theory	5	CO1	L3
(OR)			
c. Compare the yield criteria of Tresca and Von Mises.	5	CO2	L3
d. Derive Maxwell stress functions.	5	CO3	L2
5.a. State the theories of failure with examples.	5	CO4	L2
b. Explain Prandle stress Reuss- strain relationship.	5	CO1	L2
(OR)			
c. Illustrate a short note on Displacement function	5	CO2	L3
d. Explain Principal stress theory.	5	CO2	L2
6.a. Explain maximum strain energy theory with examples	5	CO1	L2
b. Derive the equation of equilibrium in radial direction in two dimension form for elastic body in polar coordinates	5	CO2	L2
(OR)			
c. Illustrate a short note on Flow rule.	5	CO1	L3
d. Illustrate a short note on Plastic flow	5	CO1	L3

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