

Code: MEMD2T4

I M.Tech-II Semester - Regular Examinations – August 2016**EXPERIMENTAL STRESS ANALYSIS
(MACHINE DESIGN)**

Duration: 3 hours

Max. Marks: 70

Answer any FIVE questions. All questions carry equal marks

1. Derive equilibrium equations in three dimensional Cartesian coordinates system. State the assumptions which you make in the derivation. 14 M

2.
 - a) Explain semiconductor strain gauges and its principal advantages. 7 M

 - b) Determine the principal stresses and principal strains with the help of a delta rosette mounted on an aluminum specimens with the values of $\varepsilon_A = 400\mu$, $\varepsilon_B = 200\mu$, and $\varepsilon_C = 100\mu$ $E_a = 70\text{GPa}$ $\nu = 0.3$. 7 M

3.
 - a) Explain dynamic recording at high frequencies and low frequencies. 7 M

 - b) Explain static recording of the instrument. 7 M

- 4.
- a) What are the different types of brittle coatings data available? Give their characteristics and limitations. 7 M
 - b) Explain the procedure for brittle coating data analysis. 7 M
- 5.
- a) What do you understand by Moire Fringes? How this Fringes are formed? 7 M
 - b) Explain out of plane slope measurements. 7 M
6. Given a fringe value of 5, model thickness of 6 mm, a fringe value of 16 kN/m²/m/fringe and an isoclinic parameter of 20° defining the angle between σ_1 and x axis. Determine the shear stress τ_{xy} . 14 M
7. Explain the Scattered light method and applications of the Frozen –stress method. 14 M
8. Explain the following: 14 M
- a) Fringe order determination in coating.
 - b) Stress separation method under coating.