

Code: MEMD2T4

I M.Tech-II Semester-Regular Examinations-December 2013

**EXPERIMENTAL STRESS ANALYSIS
(MACHINE DESIGN)**

Duration: 3 hours

Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. a) State the conditions of plane stress and plane strain 4M
- b) Draw Mohrs circle for a plane stress condition 4M
- c) What is the necessity of compatibility equations?
What do you mean by compatibility equations?
Write the compatibility equations in Cartesian
co-ordinates. 6M
2. What are various types of strain gauges. Explain any two
strain gauges in detail with neat sketch. 14M
3. List the advantages and disadvantages of employing an
automatic Data-Acquisition system to record strain data. 14M

4. Sketch the brittle coating pattern for the following cases
- i. A tensile specimen
 - ii. A circular shaft subjected to pure torsion
 - iii. A circular ring subjected to diametrical compression. 14M
5. Explain fringe sharpening and fringe multiplication in moire method. 14M
6. Derive the expression for light passing through a stressed model in a circular polariscope with a polarizer and analyzer in parallel position. 14M
7. a) Explain stress optic law 6M
b) What are the properties of commonly employed photoelastic materials. 8M
8. Explain stress and strain optic relations for birefringent coatings. 14M