

Subject Code: H1502/R13

M. Tech –II Semester Regular/ Supply Examinations, October, 2015

EXPERIMENTAL STRESS ANALYSIS

(Common to MD and MED)

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions

All questions carry EQUAL

1. (a) What do you understand by principle stresses and principle planes? Explain.
(b) The stress components at a point are given by the following array:

$$\begin{bmatrix} 20 & 10 & 12 \\ 10 & 16 & 20 \\ 12 & 20 & 12 \end{bmatrix} \text{ Mpa}$$

Calculate the principle stresses and principle planes?

2. (a) What are the basic characteristics of a Strain gauge? Write a a brief note in Electrical resistance Strain gauges.
(b) What are the recording instruments for strain gauges? Explain how dynamic recording of high frequencies are measured?
3. (a) What are various crack detection methods?
(b) Discuss the crack patterns which can be obtained under various combinations of stresses. Illustrate with neat sketches.
4. (a) What are neutral fringes?
(b) What are the two techniques used for moiré-fringe analysis? Discuss the displacement approach in detail?
5. With the help of neat sketches explain the function of each component of a Circular Polariscope with both dark and light field arrangements.
6. Explain the following with reference to the stress-freezing method
 - (a) Model materials
 - (b) Casting techniques
 - (c) Machining of models
7. Explain the normal and oblique incidence methods as applied to Birefringent coatings. How these methods help in separating the principal stresses?
8. Write Brief note on:
 - (a) Strain gauge rosettes
 - (b) Telemetry systems
