Sahyadri College of Engineering & Management
CENTRAL LIBRARY
Adyar, Mangalore-7

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10ME761

Seventh Semester B.E. Degree Examination, June/July 2019
Experimental Stress Analysis

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Enumerate desirable characteristics of an adhesive, explain strain gauge mounting technique. **(10 Marks)**

b. Define gauge factor and derive an expression for gauge factor. **(10 Marks)**

2 a. Define strain Rosette. With sketch give different types of strain Rosette configuration. **(06 Marks)**

b. Three strain gauges are applied to an area at a point in each a manner 'b' makes a positive angle of 30°with gauge 'a' and gauge 'c' makes a positive angle of 45° with gauge 'b'. the strain readings obtained from the gauges are as follows :

Gauge	Strain μm/m
a	−600
b	300
c	400

Calculate the principal strains, principal stresses and principal directions Take E = 210GPa and μ = 0.30. **(14 Marks)**

3 a. Briefly discuss the effect of stressed model in a circular polariscope with dark field arrangement. **(10 Marks)**

b. Briefly discuss calibrations of photo elastic material. Explain calibration of photo-elastic material using circular disc. **(10 Marks)**

4 a. Explain the shear difference method for the separation of principal stresses. **(10 Marks)**

b. List properties and explain any five properties of photo-elastic material. **(10 Marks)**

PART – B

5 a. Explain stress freezing method with neat sketch. **(10 Marks)**

b. With a neat sketch explain scattered light polariscope. **(10 Marks)**

6 a. Explain birefringence. Explain how stresses and strain can be measured using birefringent coating. **(08 Marks)**

b. How principal stresses of a coated specimen are separated by oblique incidence method? Explain in detail. **(12 Marks)**

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7 a. Brief brittle coating technique. How it is useful for stress analysis? **(04 Marks)**

b. Discuss the crack patterns which can be obtained in a brittle coating under various combinations of stresses. Illustrate your answer by sketches. **(08 Marks)**

c. Describe the calibration method generally used for brittle coating. How true threshold strains can be determined by this method. **(08 Marks)**

8 Write short notes on any four:

a. Isoclinic and Isochromatic fringes

b. Tardy's method of compensation

c. Moiré's fringes

d. Whetstone's Bridge

e. Advantage and Application of Brittle coatings. **(20 Marks)**

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