10ME761

Seventh Semester B.E. Degree Examination, Aug./Sept.2020
Experimental Stress Analysis

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. With neat sketch, explain unbounded wise and weldable strain gauge construction.

   (10 Marks)

   b. Define Gauge factor and derive an expression for electrical resistance strain gauge.

   (10 Marks)

2 a. A delta rosette yields the following strains q_a = -845µ m/m , q_b = 1220µ m/m , q_c = 710µ m/m. Calculate the Principal strains , Principal stresses , Principal directions , Maximum shear stress. Take E = 200 GPa , µ = 0.3.   **(12 Marks)**

   b. Explain briefly the factors which effect the performance of a strain gauge.   **(08 Marks)**

3 a. Explain with neat diagram , "Circular Polariscope" for dark field arrangements.   **(10 Marks)**

   b. Explain any two calibration methods for photo elastic material.   **(10 Marks)**

4 a. Establish stress optic relation for 2D photo elasticity.   **(10 Marks)**

   b. Explain any two compensation methods for 2D photo elasticity.   **(10 Marks)**

PART – B

5 a. Explain with a neat sketch, stress freezing technique in 3D photo elasticity.   **(10 Marks)**

   b. Explain scattered light polariscope, with a neat sketch.   **(10 Marks)**

6 a. Establish equations for birefringence coating stresses.   **(10 Marks)**

   b. Explain with a sketch strip coating method in birefringence.   **(10 Marks)**

7 a. Obtain relationship between the state of stress in brittle coating and modes.   **(10 Marks)**

   b. Explain the Static method of calibration in Brittle coating method.   **(10 Marks)**

8 a. Explain briefly the geometrical approach and displacement approach in Moire technique.

   (10 Marks)

   b. Discuss briefly the advantages , disadvantages and applications for moiré technique.

   (10 Marks)

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