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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 $q_a = -845\mu \text{ m/m}$, $q_b = 1220\mu \text{ m/m}$, $q_c = 710\mu \text{ m/m}$. Calculate the Principal strains , Principal stresses , Principal directions , Maximum shear stress. Take $E = 200 \text{ GPa}$, $\mu = 0.3$. (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)

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.

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