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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SECOND SEMESTER M.TECH DEGREE EXAMINATION, APRIL/MAY 2018
Mechanical Engineering

(Machine Design)

01ME6106 EXPERIMENTAL STRESS ANALYSIS

Answer *any two full* questions from *each part*

Max. Marks: 60

Duration: 3 hours

PART A

1. a. Explain Plane stress and Plain strain conditions in theory of Elasticity. (3)
b. What is a strain gauge? With neat sketches, explain the working of a Mechanical Strain gauge. (6)
2. a. Explain Cross sensitivity factor. Prove that Cross sensitivity factor of a flat grid wire depends on geometry of the edge (6)
b. Explain Gage sensitivities. (3)
3. a. Derive an expression for the principal strains using a Rectangular Rosette. Explain the procedure for drawing a Mohr's circle for the Rectangular rosette. (9)

PART B

4. a. Explain how the temperature compensation can be effected in a potentiometer circuit (4)
b. What are transducers? Discuss about any two transducers (3)
c. Explain Transient Response. (2)
5. a. What is a wave plate. Explain (3)
b. Explain how a wheat stone bridge circuit is used for dynamic strain gage applications. (6)
6. a. Derive an expression for the intensity of the emergent light from a circular polariscope for dark field arrangement (9)

PART C

7. a. Explain different methods of Residual stress measurements. (7)
b. Explain the procedure involved in brittle coating method. (5)

8. a. Explain the radiographic tests. State the advantages and disadvantages of radiographic tests (7)
- b. Explain about Dye penetrating methods of testing. State their advantages. (5)
9. a. Explain the principle and working of magnetic testing method and its advantages. (6)
- b. Explain the applications of lasers in Non-destructive Testing. (3)
- c. Explain Ultrasonic Flaw detection method. (3)

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