KUMARAGURU
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Register Number:……………………..

B.E DEGREE EXAMINATIONS: NOV/DEC2014

(Regulation 2009)

Sixth Semester

AERONAUTICAL ENGINEERING

AER114**:** Experimental Stress Analysis

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Easy and rapid measurement of strains can be done by _____ type of gauge.

    a) Tuckerman optical   b) Photoelastic

    c) Vibrating wire   d) Electrical

2. Magnification upto _____ times is achievable with the pneumatic strain gauge.

    a) 1,00,000   b) 20,000

    c) 1,20,000   d) 3,00,000

3. An extensometer is a device that is used to measure the change in

    a) length   b) thickness

    c) strain   d) stress

4. Gauge material should have

    a) High gauge factor   b) Less specific resistance

    c) hygroscopic   d) High tensile strength

5. Which of the following have high gauge factor?

    a) Gold   b) Monel

    c) Invar   d) Platinum-Iridium

6. What type of strain gauge is used in space vehicle application?

    a) Optical strain gauge   b) Electrical strain gauge

    c) Semiconductor strain gauge   d) Mechanical strain gauge

7. In a standard circular polariscope, what type of fringe is used?

    a) Isotropic   b) Isoclinic

    c) Rectilinear   d) Isochromatic

8. In _____ the strain is measured as change in the magnetic field.

    a) Inductance strain gauge   b) Capacitance strain gauge

    c) Resistance strain gauge   d) Weldable strain gauge

9. Photoelasticity works by the principle of

    a) Hooke's law   b) Stress optic law

    c) Newton's law   d) Schwarzchild's law

10. In circular polariscope model is placed after

    a) polarizer   b) analyzer

    c) First quarter wave plate   d) Second quarter wave plate

PART B (10 x 2 = 20 Marks)

11. What do you mean by experimental stress analysis?

12. Differentiate accuracy and precision.

13. What is a strain rosette?

14. What is an extensometer?

15. State stress optic law.

16. List two advantages of photoelasticity.

17. What is half cell?

18. Write down the application of photoelasticity.

19. Define isochromatics and isoclines.

20. Define holography.

PART C (5 x 14 = 70 Marks)

21. a)   Explain principle of measurements.

(OR)

    b)   Explain about the various types of mechanical strain gauges. Give their merits and demerits.

22. a)   Explain the working principle of Huggen Berger extensometer strain gauge.

(OR)

    b) (i)   Explain the working principle of optical and mechanical strain gauges   (6)

       (ii)   With neat sketch explain the working of any one of the above two strain gauges.   (8)

23. a)   Explain the working principle of Tuckerman optical strain gauge with neat sketch.

(OR)

b)   Derive an expression for output voltage of wheat stone bridge circuit for strain gauges.

24. a)   Why do we require separation technique? Explain any two separation techniques in detail.

(OR)

b)   With neat sketch explain the working principle circular polariscope.

25. a)   Explain the following:

       (i) Eddy current testing (7)

       (ii) Acoustic emission technique (7)

(OR)

b)   Explain the following:

       (i) Ultrasonic testing in NDT and their applications. (7)

       (ii) Radiography. (7)

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