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Question Paper Code : 40064

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Sixth Semester

Aeronautical Engineering

AE 8605 — EXPERIMENTAL STRESS ANALYSIS

(Common to Aerospace Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the principle of measurement.
2. Differentiate sensitivity and Range.
3. How temperature compensation is carried out?
4. State wheat stone bridge principle.
5. Mention the photo elastic effects.
6. Enumerate the significance of there dimensional photo elasticity.
7. How coating is prepared?
8. Write the uses of noise fringe pattern.
9. Why non-destructive testing is essential?
10. List the application of thermograph.

PART B — (5 × 13 = 65 marks)

11. (a) Illustrate the principles, working and application of mechanical and electrical extensometers.

Or

- (b) Discuss in detail about the capacitance gauges and laser displacement sensors.

12. (a) Describe the various methods of calibration and the materials used for strain gauges.

Or

- (b) Explain the significance of the following
- (i) Strain indicators (5)
 - (ii) Load cells (4)
 - (iii) Data acquisition system. (4)

13. (a) Illustrate the concept of plane and circular polariscopes in detail.

Or

- (b) How the interpretation of fringe pattern is done? Explain about compensation and separation-techniques in detail.

14. (a) Demonstrate the stages involved in application of stress coat with the help of neat sketch.

Or

- (b) Explain the use of failure theories in brittle coating.

15. (a) Discuss in detail about the principle, working and applications of acoustic emission with the help of neat sketch.

Or

- (b) Illustrate the advantages, disadvantages and application of the following NDT methods
- (i) Ultrasonics (3)
 - (ii) Eddy current testing (5)
 - (iii) Fluorescent Penchant testing. (5)

PART C — (1 × 15 = 15 marks)

16. (a) (i) Illustrate the six component balance in detail. (7)
(ii) State the advantages of optical and acoustical extensometers. (8)

Or

- (b) Illustrate the Moire method of strain analysis with a case study. (15)