Reg. No. | | | | | | | | | | | | |

Question Paper Code : 51032

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Sixth Semester

Aeronautical Engineering

AE 2352/AE 54/AE 1353/080180031/10122 AE 603 – EXPERIMENTAL STRESS ANALYSIS

(Regulations 2008/2010)

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

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. Define Accuracy and Sensitivity.
2. What do you mean by experimental stress analysis ?
3. Classify the strain gauges based on the principle of magnification.
4. What do you mean by strain rosette ?
5. Define plane polarized light and circularly polarized light.
6. State stress optic law.
7. What is holography ?
8. Explain master grating.
9. State various non-destructive testing methods.
10. Describe the operating variables affecting the performance in Eddy current inspection.

PART – B (5 × 16 = 80 Marks)

11. (a) Explain in detail with neat sketches the working of optical and electrical extensometers.

OR

(b) What are the different measurements that can be used to estimate the stress in material ?

12. (a) Explain the principle, construction and working of any one mechanical strain gauge and one optical strain gauge with neat sketches.

OR

(b) The observations noted for rectangular rosette are given below. Determine the principal stresses, principal strains and Principal angles. Find also the maximum shear stresses

$\varepsilon_0 = -200$ μmm/mm

$\varepsilon_{45} = +400$ μmm/mm

$\varepsilon_{90} = +100$ μmm/mm

E = 210 GPa, Poisson ratio = 0.3

13. (a) What is meant by compensation technique in photoelasticity ? Explain any one compensation method in detail.

OR

(b) What is meant by separation techniques in photoelasticity ? Explain any two separation techniques in detail.

14. (a) List various brittle coating methods and explain in detail any two methods.

OR

(b) Explain the term Moire fringes. Explain in detail the principle and procedures involved in the determination of stress values.

15. (a) Discuss the following :

(i) Cracks detection with Eddy currents.

(ii) Metal sorting with Eddy currents.

OR

(b) (i) Distinguish between Eddy current and Magnetic inspection methods.

(ii) Discuss the various applications of the Eddy current inspection.
