B.E. (Aeronautical Engineering) Eighth Semester (C.B.S.)

Elective-III : Experimental Stress Analysis

P. Pages : 2 **NRT/KS/19/3735**

Time : Three Hours * 0 7 4 3 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.
11. Use of non programmable calculator is permitted.

1. a) Drive the relation for stress & strain. **7**

b) Explain plane stress condition with suitable example. **6**

OR

2. A cantilever beam is subject to point load at its free end. Derive the necessary equation for stresses in a cantilever beam, by assuming suitable stress function. **13**

3. a) State the principles of measurements explain the tem. Accuracy. **7**

b) What is sensitivity and range of measurements? **6**

OR

4. a) Explain with neat sketch the mechanical extensometer in detail. **7**

b) What is optical acoustical? Explain in detail with neat sketch. **6**

5. a) What is electrical Resistance strain gauges? Explain any one with neat sketch. **7**

b) What are the different materials are used for stain gauges? State the different properties of materials. **7**

OR

6. a) Derive equation for measurement of strain using Rosetles. **7**

b) Explain Wheatstone bridge circuits for static & Dynamic strain measurements. **7**

7. a) Explain the term photoelasticity. Give its advantages & disadvantages. **6**

b) State the various materials used for making photo – elastic sheets. Explain the required properties of photoelastic materials. **7**

OR

8. a) What is stress optic law? Derive expression for it. **7**

b) What is fringe pattern? Explain the different types of fringe pattern. **6**

9. a) Discuss the mechanism of Moire's fringe technique to analyse the strain. **10**

b) How we measure plastic deformation by Moire method. **4**

OR

10. a) Explain the stress & strain developed in brittle coating techniques. **10**

b) State the basic principle of Holography and give its some application. **4**

11. a) What are the basic fundamentals of Non – Destructive Testing? Give its advantages & disadvantages. **7**

b) Write a short note on Radiography. **6**

OR

12. a) How liquid penetrant testing is done with the help of Fluorescent technique. **7**

b) Explain in detail about magnetic particle testing technique? **6**

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