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Question Paper Code: 32962

M.E. DEGREE EXAMINATION, NOVEMBER 2015

Elective

Structural Engineering

01PSE501 - EXPERIMENTAL TECHNIQUES AND INSTRUMENTATION

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Define strain sensitivity of the strain gauge.
2. What is photo elasticity?
3. What is XY Plotter?
4. What is meant by damping and way it is required?
5. Distinguish between orifice plate and flow nozzle.
6. Define pressure transducers.
7. What is an ideal structure?
8. List the requirements for demoliting a structure.
9. What is the advantage of brittle coating method?
10. What is use of GPR?

PART - B (5 x 14 = 70 Marks)

11. (a) (i) How strain gauges are classified? What are the advantages of electrical resistance wire strain gauges over other strain gauges? (7)
- (ii) Describe in detail the working of capacitance type strain gauge. (7)

Or

- (b) List the various Mechanical Strain Gauges. Explain the principle of any one with neat sketch. (14)

12. (a) (i) Explain the working of any one type of seismograph. (7)
(ii) Explain Dilatometers, Tiltometers and Gravimeters. (7)

Or

- (b) (i) Explain the use and functioning of digital data acquisition system. (7)
(ii) Explain the basic principle and working of seismographs. (7)

13. (a) Explain the principle of pressure and flow measurements and explain the working of pressure transducers. (14)

Or

- (b) (i) Explain the principle of dimensional homogeneity. (7)
(ii) Distinguish between the Direct and Indirect method of model analysis. (7)

14. (a) What are the different types of corrosion? Explain the different methods adopted to prevent/control the corrosion. (14)

Or

- (b) Write a short note on:
(i) Mechanism of corrosion of steel in concrete (5)
(ii) Factors that influence corrosion of steel in concrete (5)
(iii) List various methods to measure corrosion. (4)

15. (a) (i) Explain the methods of ultrasonic test. (7)
(ii) Explain how laser is used in structural testing. (7)

Or

- (b) Explain the principle and working of ultrasonic pulse echo technique. (14)

PART - C (1 x 10 = 10 Marks)

16. (a) What are the causes of distress in structures? Explain their mitigations. (10)

Or

- (b) Explain the various types of brittle coating. (10)