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**Question Paper Code: 53P63**

M.E. DEGREE EXAMINATION, NOV 2017

Third Semester

Structural Engineering

15PSE302 – EXPERIMENTAL TECHNIQUES AND INSTRUMENTATION

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. A \_\_\_\_\_ may be defined as any instrument or device that is employed to measure the linear deformation over a gauge length.  
(a) Hydraulic jack (b) Strain Gauge  
(c) Combined lever (d) Dial Indicator
2. \_\_\_\_\_ are instruments used to record and measure earthquakes.  
(a) Seismometer (b) Seismograph  
(c) Seismogram (d) Accelerograph
3. \_\_\_\_\_ is the deliberate destruction of structures and materials by means of explosives, mechanical devices, fire, chemical agents.  
(a) Demolition (b) Galvanizing  
(c) Stress Relaxation (d) Routing
4. SBR \_\_\_\_\_  
(a) Signal to Background Ratio (b) Signal to Blank Ratio  
(c) Signaling to Blurred Responding (d) Simultaneous to Broadcasting Reference
5. A technique used to determine a structures vibration characteristics  
(a) Similitude (b) Finite element method  
(c) Modal analysis (d) Oriented analysis

PART B - (5 x 3 = 15 Marks)

6. What is Dummy gauge?
7. What is Vibrationmeter?
8. Define sound level meter.
9. Define Structural health Monitoring.
10. State the principle of rebarlocator.

PART C - (5 x 16 = 80 Marks)

11. (a) Explain photo elasticity. Write it's advantage and its characteristics. (16)

Or

- (b) Discuss the associated instrumentation for measuring (i) Static strain  
(ii) Dynamic strain. (16)

12. (a) Explain briefly the working principle of LVDT. (16)

Or

- (b) Explain briefly about Data Acquisition System. (16)

13. (a) Explain vibration-meter and vibration-analyzer. (16)

Or

- (b) Draw block diagram of digital data acquisition systems and explain the operation. (16)

14. (a) Describe the various types of strengthening techniques adopted for structural distress. (16)

Or

- (b) Describe the construction and uses of half-cell. (16)

15. (a) What are the crack measurement technique and how to observe the development of cracks. (16)

Or

- (b) Define ultrasonic pulse echo testing, impact echo testing and impulse radar test. (16)