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Question Paper Code: 42623

M.E. DEGREE EXAMINATION, NOV 2016

Second Semester

Structural Engineering

14PSE203 - EXPERIMENTAL TECHNIQUES AND INSTRUMENTATION

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - $(5 \times 1 = 5 \text{ Marks})$

- 1. _____ is the smallest value of strain which can be read on the scale associated with the strain gauge.
 - (a) Range (b) Sensitivity (c) Gauge length (d) Readability
- 2. Range of violet colour matching is
 - (a) 4000 to 45000 (b) 4500 to 5000 (c) 5000 to 5500 (d) 5500 to 6000
- 3. The wind tunnel is used to predict accurate ______ for the structural frames.
 - (a) Velocity (b) Design loads
 - (c) Gravity loads (d) Active pressure
- 4. Severe corrosion in steel measured in Half cell potential meter is

(a) 0 to 100 <i>mA</i>	(b) 100 to 200 <i>mA</i>
(c) 200 mA to 300 mA	(d) above 300 <i>mA</i>

5. The process in which the wave is recorded in such a way that a subsequent illumination of this record serves to reconstruct the original object wave is called as _____

(a) Inter-ferometry	(b) Moire's fringe

(c) Holography (d) Photo elasticity

PART - B (5 x 3 = 15 Marks)

- 6. Define gauge length and sensitivity.
- 7. Define vibration. What are the quantities to be measured in vibration?

- 8. List the pressure measuring electrical transducers.
- 9. What are the common causes of distress in RCC structures?
- 10. What is grating? What is the pitch of a grating in Moire fringe methods?

PART - C (5 x
$$16 = 80$$
 Marks)

11. (a) Discuss briefly the following: limitations of optical gauges, proving rings, principles of photo elasticity and calibration of testing machines. (16)

Or

- (b) Briefly discuss about the calibration of testing machines. (16)
- 12. (a) Explain how LVDT's are constructed, its output voltage characteristics and how null voltage of LVDT's can be improved. (16)

Or

- (b) Explain the working procedure of cathode ray oscilloscope with a neat sketch. Also mention its applications. (16)
- 13. (a) Explain the construction of a wind tunnel with neat sketch and how it is used in structural analysis. (16)

Or

(b) (i)	What are the applications of pre-	sure transducer? (8))
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- (ii) Explain direct and indirect method of model analysis. (8)
- 14. (a) Brief the controlled blasting, corrosion of reinforcement in concrete. (16)

Or

- (b) What are the factors which lead to corrosion of reinforcement in concrete? Also state the remedial measures to be adopted. (16)
- 15. (a) Write notes on rebound hammer, laser for structural testing. (16)

Or

(b) Explain the principle and working of ground penetration radar. (16)