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**Question Paper Code: 92063**

M.E. DEGREE EXAMINATION, OCTOBER 2014.

Elective

Structural Engineering

01PSE514 – EXPERIMENTAL STRESS ANALYSIS AND TECHNIQUES

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What is mean by strain rosettes?
2. Write short note on photo elasticity principle.
3. What is the function of Cathode Ray Oscilloscope in vibration measurement?
4. What is mean by velocity transducers?
5. What are the types of cracks?
6. What is mean by half cell and how it is useful in determine the extent of corrosion.
7. Define brittle coating.
8. What is mean by ultrasonic testing and how it is useful in assessing the concrete strength?
9. What is mean by dimensional similitude?
10. What is mean by direct model and indirect model?

PART - B (5 x 14 = 70 Marks)

11. (a) (i) Explain in detail about two types of strain measuring instruments. (7)  
(ii) Explain in detail about the application of moiré fringe in measurement of stress and strain levels in a photo elastic model. (7)

Or

- (b) (i) Draw a neat sketch of a wheat stone bridge and explain how it is used in measuring strains. (7)  
(ii) Explain in detail about the uses of electronic load cell and proving ring in determining the stress level on a model. (7)

12. (a) Draw a neat sketch of a Linear Variable Differential Transducer (LVDT) and explain how it is working in the determination of strain. (14)

Or

- (b) Write short note on:  
(i) Seismic transducer.  
(ii) X-Y Plotter.  
(iii) Digital data acquisition systems.  
(iv) Velocity transducers. (14)

13. (a) Explain in detail about the formation and causes of cracks and what are the methods of measuring the cracks in laboratory. (14)

Or

- (b) Explain in detail about the corrosion of reinforcement in R.C. structures and how the corrosion mapping can be done using the Half cell measurements. (14)

14. (a) Write short note on:  
(i) Rebound hammer.  
(ii) Ultrasonic testing.  
(iii) Ultimate load testing.  
(iv) Stress coat. (14)

Or

- (b) Write a detailed procedure for some of the in-situ load tests to assess the extent of damage in as structure. (14)

15. (a) (i) What is the necessity of model analysis? (7)  
(ii) What is mean by scale effect in models? (7)

Or

- (b) (i) What are the limitations of model investigations? (7)  
(ii) What are the uses of influence lines in model studies? (7)

PART - C (1 x 10 = 10 Marks)

16. (a) Write step-by-step procedure for distress and damage assessment in a building with various techniques.. (10)

Or

- (b) What are the applications of various coating method in Non Destructive Testing (NDT) methods and how will you evaluate a coating? (10)
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