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M. Tech. (Civil Engineering)
(Computer Aided Structural Engineering)
3rd Semester Examination, December-2022
STRUCTURAL HEALTH MONITORING
Paper-21MTCASE23C1

Time allowed : 3 hours] [Maximum marks : 100

Note : Attempt any five questions. All questions carry equal marks. Question No. 1 is compulsory. Attempt one question from each section.

1. (i) Define the concept of health monitoring of structures. 5×4=20
- (ii) Name the types of Dynamic Field Test.
- (iii) Explain any two methods of Quality Control Testing of Concrete.
- (iv) Define sensor systems in static structural health monitoring.
- (v) Explain the process of Dry mix shotcrete.

Section-A

2. (a) Explain the mechanism of various causes of deterioration in post-construction stage. 10

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- (b) State various Alteration methods in Structural Safety. Explain in detail. 10
3. (a) Explain the need and importance of quality control and quality audit in structures. 12
- (b) What are smart material and explain their applications in structural health monitoring ? 8

Section-B

4. (a) Explain Principle of Rebound Hammer Test and give its applications and limitations. 10
- (b) Discuss Simulation and Loading methods in static structural health monitoring. 10
5. (a) Write short notes on intelligent structural health monitoring. 8
- (b) What are the factors influencing the pulse velocity measurement ? Explain principle and procedure for Ultrasonic pulse velocity test. 12
- Section-C**
6. (a) What are the various model based techniques in dynamic structural health monitoring ? 10

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- (b) Write short notes on data based techniques in vibration based structural health monitoring. 10
7. (a) Discuss the role of Hardware in Remote Data Acquisition Systems. 8
- (b) What are the fundamental principles for Electromagnetic methods of testing for concrete ? 12

Section-D

8. (a) Enumerate the different methods available for repairs of concrete works. Discuss any one in detail. 10
- (b) Define and explain in detail about electro-mechanical impedance (EMI) technique. 10
9. (a) Explain the process of guniting in detail with figure. 10
- (b) Discuss the method of underpinning in detail. 10

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