Reg. No. : | | | | | | | | | | | | |

Question Paper Code: R8170

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

One Credit Course

R21UCE870- HEALTH MONITORING OF STRUCTURES

Civil Engineering

(Regulations R2021)

Duration: 1.30 hours Maximum: 50 Marks

Answer ALL Questions

PART A - (9 x 2 = 18 Marks)

1.	List any two factors affecting the health of a structure.	CO1-U	
2.	Mention two common causes of distressing reinforced concrete structures	CO1-U	
3.	What is the importance of SHM in bridges?	CO1-U	
4.	Differentiate between global and local monitoring in SHM(any two points)	CO1-U	
5.	State the importance of maintenance in prolonging the service life of structures.	CO1-U	
6.	Define Structural Health Monitoring (SHM) and mention its primary objective.	CO1-U	
7.	What is the principle of Electro–Mechanical Impedance (EMI) technique?	CO1-U	
8.	Differentiate between static and dynamic field tests with one example each.	CO1-U	
9.	Write two advantages of using piezoelectric materials in SHM	CO1-U	

PART – B (2 x 16= 32 Marks)

10.	(a)	Demonstrate the fundamental concepts and objectives of Structural Health Monitoring (SHM) by applying them to modern civil infrastructure and illustrate with suitable example how SHM techniques are implemented in practice.	CO2-App	(16)
		Or		
	(b)	Based on a site visit ss(real or hypothetical) How detailed SHM-based assessment covering causes of distress safety evaluation, maintenance strategy, and testing methods.	CO2-App	(16)

11.	(a)	Analyze a maintenance plan for a highway bridge using SHM principles .Explain how this plan can help in preventing catastrophic failure.	CO5-Ana	(16)
		Or		
	(b)	Analyze the application of Structural Health Monitoring (SHM) in civil engineering structures by breaking down its key components, and examine how vibration based damage detection contributes to identifying structural faults and supports preventive maintenance strategies in bridges and buildings.	CO6-Ana	(16)