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

Question Paper Code:U5618

M.E. DEGREE EXAMINATION, DEC 2025

Professional Elective

Structural Engineering

21PSE518 – STRUCTURAL HEALTH MONITORING

(Regulations 2021)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

1.	(a)	How to apply maintenance management concepts as a consultant engineer to create a preventive strategy that will increase the strength, durability, and economics of RC structures.	CO2-App	(20)
		Or		
	(b)	Assess the structural health and causes of distress in a building. Propose remedial measures, preventive actions, and safe alterations to ensure functionality and structural safety.	CO2-App	(20)
2.	(a)	During a structural audit of a bridge, signs of fatigue cracks and corrosion are detected. Apply investigation management procedures to plan suitable repair, retrofitting, and monitoring interventions.	CO2-App	(20)
		Or		
	(b)	A coastal RC structure shows spalling and reinforcement corrosion. Apply SHM techniques to detect the extent of damage and recommend a long-term rehabilitation plan.	CO2-App	(20)
3.	(a)	During a static load test on an industrial floor, the deflection exceeds allowable limits. Analyze the response data and recommend measures to mitigate structural weakness.	CO4-Ana	(20)
		Or		
	(b)	A bridge deck needs monitoring under service loads. Propose static response measurement techniques and select appropriate sensors to ensure accurate data acquisition.	CO4-Ana	(20)

4.	(a)	Summarize the pros and cons of model based techniques in vibration based structural health monitoring.	CO3-App	(20)
		Or		
	(b)	Develop in detailed concept of the advantages and disadvantages of model-based methods in vibration-based structural health monitoring?	CO3-App	(20)
5.	(a)	Discuss how Piezo– electric materials are used in structural health monitoring with suitable applications in research field.	CO2-App	(20)
		Or		
	(b)	Explain the importance of electromagnetic independence technique in structural health monitoring. State its real world examples.	CO2-App	(20)