

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code: U1105

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

Professional Elective

21CEV105 REPAIR AND REHABILITATION OF STRUCTURES

Civil Engineering

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Define assessment in structural maintenance. CO1-U
2. What is rehabilitation in concrete structures? CO1-U
3. List two quality assurance steps in concrete. CO1-U
4. List two effects of corrosion in RCC structures. CO1-U
5. What is meant by high strength concrete? CO1-U
6. Define polymer concrete CO1-U
7. List the types of shoring. CO1-U
8. Define underpinning. CO1-U
9. State one repair method for fire-damaged concrete structures. CO1-U
10. What is the purpose of injection grouting in leakage control CO1-U

PART – B (5 x 16= 80 Marks)

11. (a) Differentiate the common crack repair methods for concrete structures and analyze their effectiveness in restoring structural integrity and durability. CO2- Ana (16)
- Or
- (b) Classify the types of maintenance in structures and analyze the objectives of each category in preserving structural performance and longevity. CO2- Ana (16)

12. (a) Analyze the mechanisms of reinforcement corrosion in concrete structures and evaluate the effectiveness of various prevention methods. **CO3- Ana** (16)
- Or
- (b) Classify the different types of cracks in concrete and analyze the underlying causes for each type. **CO3- Ana** (16)
13. (a) Classify the constituents of polymer concrete, analyze its mechanical and chemical behavior, and evaluate its applications across various structural and non-structural contexts. **CO3- Ana** (16)
- Or
- (b) Analyze the mechanical and durability properties of Geopolymer Concrete, and evaluate how these properties influence its performance compared to conventional Portland cement concrete. **CO3- Ana** (16)
14. (a) For a reinforced concrete structure showing early signs of corrosion, suggest appropriate cathodic protection techniques and explain how they can be implemented to prevent further deterioration. **CO5- App** (16)
- Or
- (b) Apply suitable integrated corrosion protection systems to an RCC bridge located in a marine environment, and justify how they enhance the durability of the structure. **CO5- App** (16)
15. (a) Apply suitable rehabilitation techniques to restore a cracked heritage masonry building, and justify your choice with appropriate examples. **CO6- App** (16)
- Or
- (b) Given a heritage structure showing signs of deterioration, recommend suitable restoration techniques and justify your choices to preserve its structural integrity and historical value. **CO5- App** (16)