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Seventh Semester B.E. Degree Examination, July/August 2021 Rehabilitation and Retrofitting of Structures

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Explain the following terms:
(i) Strengthening (ii) Defects (iii) Deterioration (iv) Repair (08 Marks)
- b. Define distress. Mention the types of distress in concrete structures and explain any three of them in detail. (12 Marks)
- 2 a. Mention the physical, chemical, thermal and structural causes of damage and explain any one of them under physical or structural causes. (10 Marks)
- b. Explain the various causes and mechanism of deterioration in concrete. (10 Marks)
- 3 a. What are the objectives of conditional assessment and write the associated flow chart for assessment procedure. (10 Marks)
- b. What is the necessity of detailed investigation? Explain the scope and methodology of detailed investigation. (10 Marks)
- 4 a. What are the different In-situ and laboratory tests for evaluation of mechanical and chemical properties and explain any one of them in both categories. (12 Marks)
- b. What are the different types of cracks and how they can be evaluated in concrete? (08 Marks)
- 5 a. How does freeze and thaw cycles disintegrate concrete? Explain the mechanism and preventive methods. What repair method can be proposed for this type of cracking? (10 Marks)
- b. What are Design of Construction Errors in concrete? Explain them. (05 Marks)
- c. Explain the effects of cover thickness and cracking on durability of concrete. (05 Marks)
- 6 a. Explain the mechanism of corrosion in concrete with neat sketches and mention the list of preventive methods of corrosion. (10 Marks)
- b. Discuss the method of Cathodic Protection of steel in concrete with neat sketches and two ways of achieving cathodic protection. (10 Marks)
- 7 a. Why the concrete structure need to be maintained? Discuss the classification and importance of maintenance. (08 Marks)
- b. Explain the Jacketing technique of retrofitting of beam-column junction with neat sketch. What are the cares to be taken in this technique? (12 Marks)



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- 8 a. What is external bonding technique of retrofitting? How is it different from external post tensioning? Explain both the methods. (12 Marks)
- b. What is Near Surface Mounted technique? Explain it with neat sketch. (08 Marks)
- 9 a. Explain the repair material Steel Fibre Reinforced Concrete (SFRC), its characteristics and applications. (10 Marks)
- b. Explain the repair material Foamed Concrete, its process of manufacture and properties. (10 Marks)
- 10 a. What are Guniting and Shotcrete processes. Explain the dry mix application with a neat sketch and compare the dry mix and wet mix advantages. (10 Marks)
- b. Write short notes on :
- (i) Epoxy injection
 - (ii) Shoring
 - (iii) Underpinning. (10 Marks)

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