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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R,S) / (WP), S4 (PT) Exam April 2025 (2019 Scheme)

Course Code: CET352

Course Name: ADVANCED CONCRETE TECHNOLOGY

Max. Marks: 100

Duration: 3 Hours

Use of attested copies of pages 3 to 6 of IS -10262 (2019) is permitted

PART A

Answer all questions, each carries 3 marks.

Marks

- | | | |
|----|---|-----|
| 1 | How does aggregate shape and size affect properties of concrete? | (3) |
| 2 | What are mineral admixtures? | (3) |
| 3 | What are the variables in concrete mix design? | (3) |
| 4 | Explain the importance of quality control of concrete. | (3) |
| 5 | Why is cube strength more than cylinder strength in concrete? | (3) |
| 6 | What do you mean by workability of concrete? | (3) |
| 7 | What are the factors affecting corrosion of reinforcement in concrete? | (3) |
| 8 | Distinguish between semi- destructive and non-destructive testing of concrete with examples | (3) |
| 9 | List the advantages of roller compacted concrete. | (3) |
| 10 | Write short notes on self-compacting concrete. | (3) |

PART B

Answer one full question from each module, each carries 14 marks.

Module I

- | | | |
|----|---|-----|
| 11 | a) Explain the procedure for manufacture of Portland cement. | (8) |
| | b) What do you mean by hydration of cement? Discuss the hydration of Bogue's compounds in cement. | (6) |

OR

- | | | |
|----|--|-----|
| 12 | a) Explain any 4 types of chemical admixtures used in concrete. | (8) |
| | b) Write short notes on i) grading of aggregates ii) artificial aggregates | (6) |

Module II

- | | | |
|----|--|-----|
| 13 | a) Discuss the different methods for concrete mix design. | (6) |
| | b) Explain the procedure for mix design of concrete using IS code method | (8) |

OR

- 14 Design a concrete mix for the following data as per IS10262- 2019: (14)
 Grade of concrete: M30, Cement - OPC 43 grade, severe exposure, Workability – 100mm (slump), 20mm maximum size angular crushed aggregate, Fine Aggregate grading zone II, Sp. Gravity of cement – 3.15, Sp. gravity of coarse aggregate – 2.6 Sp. Gravity of fine aggregate – 2.7. Assume all aggregates in SSD condition. Any other missing data may be suitably assumed.

Module III

- 15 a) Describe the factors affecting workability of concrete. (10)
 b) Explain maturity concept of concrete. Explain its significance (4)

OR

- 16 a) What are the factors affecting creep of concrete? Explain how the creep of concrete can be minimised. (8)
 b) What are the different moduli of elasticity determined for concrete? (6)

Module IV

- 17 a) Write short notes on i) alkali aggregate reaction ii) sulphate attack. (7)
 b) Describe the procedure for conducting pull out test in concrete. What are its advantages and disadvantages? (7)

OR

- 18 a) Write short notes on fire resistance of concrete. (6)
 b) How is reinforcement cover measured in concrete? (8)

Module V

- 19 a) Write short notes on sprayed concrete and pumped concrete. (6)
 b) Explain fibre reinforced concrete discussing its constituents, properties, advantages and disadvantages. (8)

OR

- 20 a) Explain the methods for concreting under water. (9)
 b) What are the advantages and disadvantages of 3D concrete printing? (5)
