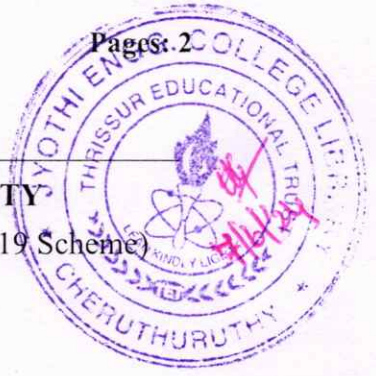


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R,S) / S4 (PT) (R,S) Examination May 2024 (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 | What are superplasticizers and how do they improve the performance of concrete? | (3) |
| 2 | What is an artificial aggregate? List two advantages of using artificial aggregates in construction. | (3) |
| 3 | List out the variables involved in mix proportioning. | (3) |
| 4 | Explain the need of statistical quality control in concrete. | (3) |
| 5 | What are the factors affecting creep? | (3) |
| 6 | Define autogenous shrinkage and carbonation shrinkage. | (3) |
| 7 | List three advantages of non-destructive testing over conventional testing. | (3) |
| 8 | What are the causes of corrosion of embedded steel reinforcement in concrete? | (3) |
| 9 | Write short notes on green concrete. | (3) |
| 10 | Enlist the benefits of employing pre-fabrication technology in construction. | (3) |

PART B*Answer one full question from each module, each carries 14 marks.***Module I**

- | | | |
|----|---|------|
| 11 | a) What are the different stages involved in the manufacture of cement? | (10) |
| | b) Write a short note on aggregate crushing value. | (4) |

OR

- | | | |
|----|---|-----|
| 12 | a) What are accelerators and retarders? Explain their mechanism of action in concrete. | (7) |
| | b) What is GGBS? What is its effect on the performance of fresh concrete and hardened concrete? | (7) |

Module II

- 13 a) Write short notes on mean strength, standard deviation and co-efficient of variation. (6)
- b) Discuss the factors that engineers take into consideration while determining the mix proportions for concrete. (8)

OR

- 14 Design a concrete mix for the following data as per IS 10262:2019: (14)
- Grade of concrete – M25, Cement – OPC grade 43, Exposure condition – severe, Zone II sand, slump – 75 mm, maximum size of aggregate – 20 mm, crushed, angular; specific gravity of cement – 3.1, specific gravity of fine and coarse aggregates – 2.7 and 2.8, admixture – superplasticizer.
- Assume all aggregates in SSD condition. Assume any other data suitably.

Module III

- 15 a) Discuss any three properties of hardened concrete and their significance in the performance of a structure. (10)
- b) Write a short note on modulus of elasticity of concrete. (4)

OR

- 16 a) Elaborate slump test including its procedure, significance, and interpretation of results in terms of workability. (8)
- b) Define creep and shrinkage. How do these impact concrete structures? (6)

Module IV

- 17 a) Describe a test to measure the reinforcement cover in a beam. (6)
- b) Define durability. Explain any six factors that affect durability of concrete. (8)

OR

- 18 a) How exposure to sea water can affect concrete structures? (6)
- b) Elaborate a test that shall assess the penetration resistance of concrete. (8)

Module V

- 19 a) Compare and contrast high strength concrete and high performance concrete. (6)
- b) List the advantages and disadvantages of ready-mix concrete. (8)

OR

- 20 a) Explain the properties of self-compacting concrete. (6)
- b) Write short notes on slipform construction and 3D printing of concrete. (8)
