

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Sixth Semester B.Tech Degree Examination June 2022 (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 | Explain the effect of size and shape of coarse aggregates on properties of fresh concrete. | (3) |
| 2 | Describe the effects of fly ash as a mineral admixture on properties of fresh concrete. | (3) |
| 3 | Differentiate between nominal mix and design mix. | (3) |
| 4 | List out the factors considered in the design of concrete mix. | (3) |
| 5 | Describe shrinkage in concrete. List the different forms of shrinkage in concrete. | (3) |
| 6 | Describe the effect of water cement ratio on fresh, hardened and durability properties of concrete. | (3) |
| 7 | Explain the effect of sea water on durability of concrete. | (3) |
| 8 | Enumerate any three area where NDT can be effectively used in reinforced concrete systems. | (3) |
| 9 | List any three advantages and disadvantages of light weight aggregate concrete. | (3) |
| 10 | Write short note on mass concreting. | (3) |

PART B

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

Module I

- | | | |
|----|---|-----|
| 11 | a) Describe the properties of Bogue's compound. | (8) |
| | b) Define the initial and the final setting time of cement with their significance in the concrete construction practice. | (6) |

OR

- 12 a) Explain the effect of any four types of chemical admixtures on different properties of concrete (8)
b) Describe the classification of aggregates according to the sources. (6)

Module II

- 13 a) Explain the relevance and measures of statistical quality control of concrete. (7)
b) Describe the acceptance criteria to ensure quality of concrete. (7)

OR

- 14 Design a concrete mix for the following data as per IS 10262: 2019. (14)
Grade of concrete: M25, Cement - OPC of 43 grade, moderate exposure, Zone III sand, workability- 75mm (slump), 20mm maximum sized rounded coarse aggregate. Specific gravity of cement – 3.15; Specific gravity of coarse aggregate – 2.63; Specific gravity of fine aggregate – 2.65; Assume all aggregates in SSD condition. Any other missing data may be assumed suitably.

Module III

- 15 a) Explain any two properties of hardened concrete and suggest any two methods to improve it. (6)
b) Describe any two tests to find workability of concrete. (8)

OR

- 16 a) Explain any six factors affecting the strength of concrete. (6)
b) Define creep. Explain any three factors which affect creep of concrete. (8)

Module IV

- 17 a) List the factors which promote corrosion of embedded steel in concrete. (8)
Suggest any four methods to control corrosion of embedded steel in concrete. Explain any two control measures in detail.
b) Explain any four methods for controlling sulphate attack in concrete. (6)

OR

- 18 a) Describe the factors influencing test results of ultra sonic pulse velocity test. (6)
b) Explain the procedure for an NDT to find surface hardness of concrete surface. (8)

Module V

- 19 a) Explain any three properties of self-compacting concrete. Specify any two field application of self-compacting concrete. (8)
- b) What is Fibre reinforced concrete (FRC)? Describe the factors affecting the properties of fibre reinforced concrete. (6)

OR

- 20 a) Describe slip form construction and list out any two applications of it. (6)
- b) Explain the types of polymer concrete highlighting its properties and applications. (8)
