Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Sixth Semester B.Tech Degree Supplementary Examination May 2023 (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		State the advantages of using well graded aggregates in concrete construction.	(3)
2		Explain the chemical composition of Ordinary Portland Cement.	(3)
3		List out various methods of mix design.	(3)
4		Describe the role of standard deviation and coefficient of variation in the statistical quality control of concrete.	(3)
5		List any three factors affecting properties of fresh concrete.	(3)
6		Define plastic shrinkage and drying shrinkage.	(3)
7		Describe any three methods for controlling corrosion in steel reinforcement embedded in concrete.	(3)
8		List out three uses of conducting NDT in concrete.	(3)
9		List any three effects of fibres on concrete.	(3)
10		Write notes on 3D concrete printing.	(3)

PART B

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

Module I

11	a)	Describe hydration of cement. Compare products of hydration in terms of rate of hydration.	(8)
	b)	Explain Rheology of concrete using Bingham model.	(6)

OR

12	a)	Discuss the effect of super plasticizers on properties of fresh and hardened concrete.	(6)

b) Describe effect of fly ash on the properties of fresh and hardened concrete. (8)

Module II

13 a) Explain sampling and acceptance criteria to be followed to maintain quality of concrete. (8)

b) Discuss the factors affecting mix proportion in concrete. (6)

OR

14 Design a concrete mix for the following data. (14)

Grade of concrete: M30, Cement -OPC of 53 grade, severe exposure, Zone III sand, workability - 100mm (slump), 20mm maximum sized rounded aggregate. Specific gravity of cement, sand and coarse aggregates are 3.15, 2.65 and 2.68 respectively. The water absorption of sand and coarse aggregates are 1% and 0.2% respectively. Assume aggregates in dry condition. Assume any missing data suitably.

Module III

15 a) Explain the effect of w/c ratio on fresh and hardened concrete properties. (8)

b) Differentiate between (i) slump test (ii) compaction factor test and (iii) Vee Bee consistometer test in terms of its suitability of applications. (6)

OR

16 a) Explain the procedure to determine tensile strength of concrete. (6)

b) Define shrinkage in concrete. Explain different types of shrinkages in concrete. (8)

Module IV

17 a) Define carbonation of concrete and the list factors affecting it. Explain any two factors in detail. (8)

b) Describe the factors affecting durability of concrete in sea water. (6)

OR

18 a) Explain the procedure of an NDT method suitable to assess the penetration resistance of concrete. (8)

b) Discuss the factors influencing test results of rebound hammer test. (6)

Module V

19 a) Differentiate between high strength concrete and high performance concrete. (5)

b) Distinguish between (i) Polymer concrete (ii) Latex-modified concrete, and (iii) Polymer-impregnated concrete with respect to making, and the applications. (9)

OR

20 a) Enlist six advantages of prefabricated concrete. (6)

b) Describe the following special concretes in detail. (i) mass concrete and (ii) sprayed concrete. (8)

****