

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY  
B.Tech Degree S4 (R) (FT/WP) Examinations April 2026 (2024 Scheme)



**Course Code: PECET412**

**Course Name: CONCRETE TECHNOLOGY**

*Use of IS 10262:2019 and IS 456:2000 is permitted.*

Max. Marks: 60

Time: 2 hours 30 minutes

**PART A**

*(Answer all questions. Each question carries 3 marks)*

Marks

- |   |  |     |
|---|--|-----|
| 1 | What are mineral admixtures? Provide any three examples and state one benefit of each.           | (3) |
| 2 | Explain any three physical properties of ordinary Portland cement.                               | (3) |
| 3 | Define workability of concrete and list the factors affecting it.                                | (3) |
| 4 | Differentiate plastic shrinkage and drying shrinkage.  | (3) |
| 5 | What is meant by lightweight concrete? List any two advantages of the same.                      | (3) |
| 6 | Differentiate between nominal mix and design mix.  | (3) |
| 7 | Explain carbonation in concrete and its effect on the corrosion of embedded steel reinforcement. | (3) |
| 8 | Explain the effect of sea water on durability of concrete.                                       | (3) |

**PART B**

*(Answer any one full question from each module, each question carries 9 marks)*

**Module -1**

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|----|---|-----|
| 9  | a) List any three types of cement and mention where each is commonly used.  | (3) |
|    | b) What is meant by super plasticizer? Explain the effect of super plasticizers on properties of fresh and hardened concrete. | (6) |
| 10 | a) How will you find the standard consistency of ordinary Portland cement?  | (3) |
|    | b) What do you mean by hydration of cement? Explain the hydration process of Bogue's compounds in cement.                     | (6) |

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### Module -2

- 11 a) What is maturity concept of concrete? Explain its importance in estimating concrete strength. (3)
- b) How will you determine the compressive strength and split tensile strength of concrete? Explain. (6)
- 12 a) Describe slump test to determine workability of fresh concrete. (3)
- b) Explain the principle and test procedure of ultrasonic pulse velocity method and pull-out test. (6)

### Module -3

- 13 a) Design a concrete mix for the following data as per IS10262- 2019: (9)  
Grade of concrete: M40, Reinforced cement concrete, Cement - OPC 53 grade, severe exposure, Workability – 100mm (slump), Super plasticizer dosage – 1% of cementitious material, 20 mm 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, Sp. Gravity of chemical admixture -1.145, No mineral admixtures. Assume all aggregates in SSD condition. Any other missing data may be suitably assumed.
- 14 a) What is geopolymer concrete? List down any three applications of it. (3)
- b) What is fibre reinforced concrete? List the type of fibres. Describe the factors affecting the properties of fibre reinforced concrete. (6)

### Module -4

- 15 a) Explain slip form construction technique and its advantages. (3)
- b) Explain the concept and advantages of 3D concrete printing in construction. (6)
- 16 a) Describe the process and applications of sprayed concrete. (3)
- b) What is durability? What are the consequences of inadequate durability of a concrete structure? Explain any two factors that affect durability. (6)

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