



End Term (Even) Semester Examination May-June 2025

Roll no.....

Name of the Program and semester: B. Tech (Civil Engineering) Semester IV

Name of the Course: Concrete Technology

Course Code: TCE - 404

Time: 3 hour

Maximum Marks: 100

Note:

- (i) All the questions are compulsory.
- (ii) Answer any two sub questions from a, b and c in each main question.
- (iii) Total marks for each question is 20 (twenty).
- (iv) Each sub-question carries 10 marks.

Q1.

(2X10=20 Marks) (CO1)

- a. What are Bogue's compounds? Discuss their properties and impact on the setting and strength of cement.
- b. How does the storage of cement affect its properties? Discuss the precautions to be taken for proper storage of cement.
- c. List the major constituents of cement and describe their role in determining the properties of cement.

Q2.

(2X10=20 Marks) (CO2)

- a. Explain the acceptable limits of pH value and chloride content in water used for concrete. How does seawater affect the durability of reinforced concrete structures?
- b. Explain the significance of size, shape, and texture of coarse aggregates in concrete mix design.
- c. Explain the crushing, impact, and abrasion tests for aggregates. Why are these tests important in assessing aggregate quality?

Q3.

(2X10=20 Marks) (CO3)

- a. What are permeability reducers and surface hardeners? How do they improve the long term durability of concrete structures?
- b. What is self-compacting concrete (SCC)? Discuss its composition, properties, and applications in modern construction.
- c. Explain the function of accelerators and retarders in concrete. In what types of construction are these admixtures particularly useful?

Q4.

(2X10=20 Marks) (CO4)

- a. Explain the degree of quality control in concrete production. How does quality control impact the durability and strength of concrete structures?
- b. Describe the step-by-step process of designing a concrete mix as per IS 10262. Why is it important to follow standard procedures in mix design?
- c. List the different grades of concrete as per IS 456. How are they classified based on strength and application?

Q5.

(2X10=20 Marks) (CO5)

- a. What is the concept of concrete maturity? How is it used to estimate the strength development of concrete?
- b. What are the major factors contributing to cracks in concrete? Discuss plastic shrinkage, settlement cracks, construction joints, thermal expansion, and structural design deficiencies.
- c. Explain the various tests conducted on hardened concrete, including compressive strength, split tensile strength, and flexural strength. What factors influence the results of these tests?