



## Sixth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 Concrete Technology

Time: 3 hrs.

Max. Marks: 100

**Note:** 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. Use IS-10262 mix design code is allowed.

### Module-1

- 1 a. Explain the manufacture of cement by dry process with a flow chart. (10 Marks)
- b. Define cement. Explain the constituents of cement with their percentage and functions. (10 Marks)

OR

- 2 a. What is grading of aggregate? Explain the importance of size, shape and texture with respect to coarse aggregate? (10 Marks)
- b. List the mineral admixtures used in concrete? Briefly explain about Flyash and GGBS as admixtures. (10 Marks)

### Module-2

- 3 a. List the factors that effects workability of concrete. Mention the laboratory tests conducted to measure workability of a concrete. (10 Marks)
- b. What is the importance of curing in concrete? Briefly discuss ant two methods. (10 Marks)

OR

- 4 a. Explain the process of manufacturing of concrete. (10 Marks)
- b. Explain good and bad practices of making and using fresh concrete. (06 Marks)
- c. Explain about (i) Segregation (ii) Bleeding (04 Marks)

### Module-3

- 5 a. Explain the effect of chemical admixtures on fresh and hardened properties of concrete. (10 Marks)
- b. List the different types of chemical admixtures? Explain any two. (10 Marks)

OR

- 6 Design a concrete mix by IS method for M40 Grade Concrete as per IS 10262.
  1. Grade – M35
  2. Cement – OPC – 43 grade
  3. Maximum nominal size of aggregate : 20 mm
  4. Minimum cement content : 320 kg/m<sup>3</sup>
  5. Maximum W/C ratio : 0.45
  6. Workability : 100 mm slump
  7. Exposure condition : Moderate (for reinforced concrete)
  8. Maximum cement content : 450 kg/m<sup>3</sup>
  9. Method of concrete placing : pumping
  10. Type of aggregate : crushed angular
  11. Degree of supervision : Good
  12. Chemical admixture : super plasticizer

Test data for materials:

- (i) Specific gravity of cement : 3.15
- (ii) Specific gravity of CA : 2.74
- (iii) Specific gravity of FA : 2.74
- (iv) Water absorption for, CA : 0.5%; FA : 1.0%
- (v) Fine aggregate conforming to grading zone – I of table 4 of IS 383.

Assume other data wherever necessary.

(20 Marks)

#### Module-4

- 7 a. Explain the factors influencing the strength of concrete. (10 Marks)  
 b. Mention various non-destructive testing of concrete. Explain any two methods in brief. (10 Marks)

OR

- 8 a. Explain the testing of hardened concrete. Explain the compressive strength test of concrete as per IS codes. (10 Marks)  
 b. Define the terms:  
 (i) Water cement ratio (ii) Gel-space ratio (iii) Maturity concept  
 (iv) Modulus of elasticity (v) Poisson's ratio (10 Marks)

#### Module-5

- 9 a. What is durability of concrete? Explain the factors influencing durability of concrete. (10 Marks)  
 b. Write short notes on: (i) Shrinkage of concrete (ii) Creep (10 Marks)
- OR
- 10 a. What is sulphate attack on concrete? State the methods of controlling sulphate attack. (10 Marks)  
 b. Explain the process of carbonation, freezing and thawing in concrete. (10 Marks)

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