

Module 01

1. Explain manufacturing Process of Cement with flow chart.
2. Explain types of cement with its application.
3. Define Hydration of Cement and enlist four compounds of cement.
4. Explain physical properties of cement.
5. Explain test procedure to find initial setting time of cement.
6. Describe properties of fine aggregate.
7. How is bulking of sand measured in laboratory?
8. State specifications of water to be used for Concrete.
9. Explain classification of aggregates.
10. Define: a) Initial setting time of cement. b) Final setting time of cement
c) Hydration of Cement d) Consistency of cement
11. Describe properties of coarse aggregate.
12. Explain dry process of Cement manufacturing.
13. Explain procedure for determination of standard consistency of cement.
14. Explain procedure for determination of fineness of cement.
15. State three different grades of cement and where it is used.

Module 02

1. Explain properties of Fresh concrete.
2. Draw process diagram of concrete.
3. State factors affecting on Properties of concrete.
4. Explain types of batching in detail.
5. Explain three grades of concrete as per the provision of IS 456:200
6. Define a) Segregation b) Bleeding c) Workability d) Harshness
7. Define Workability & State Factors affecting workability.
8. Define concrete and grades of concrete.
9. Define concrete and state where high performance concrete is to be used.
10. State any four precautions to be taken to avoid segregation.
11. Explain methods of measuring workability.
12. Write a short note on curing of concrete.
13. Explain Ponding method for curing of concrete.
14. Explain slump cone test for measuring workability of concrete.
15. Explain compaction factor test for measuring workability of concrete.

Module 03

1. Define Admixtures. State any four types of admixtures and their use.
2. Explain any four types of Admixtures in detail.
3. Differentiate between Plasticizers and Super-plasticizers.
4. Define Plasticizers and state their effects on Workability.

5. Write a short note on Damp-Proofing Admixtures.
6. Define Admixtures and State purpose of adding admixtures in concrete.
7. Explain function of Air Entraining Agents.
8. Define Superplasticizers? State its uses.
9. In which situations accelerators & retarders used?
10. Define: a) Pozzolana Admixtures b) Green concrete c) Bonding Admixtures
11. Define Super-Plasticizers and state their effects on Workability.
12. Write difference between Retarder and Accelerator.
13. Explain function of Bonding Admixtures.
14. Write difference between Additive and Admixture.
15. State uses of damp proofing Admixture.

Module 04

1. Explain properties of hardened concrete.
2. Define a) Strength b) Durability c) Impermeability
3. Define: a) Characteristic Strength b) Compressive Strength c) Tensile Strength
4. Enlist the tests that are conducted for testing of Concrete.
5. What is High Performance Concrete? State its uses.
6. State effect of W/C Ratio on Strength of concrete.
7. Define High Strength Concrete? State its uses.
8. State effect of admixtures on Strength of concrete.
9. Define: a) Bond Strength b) Flexure Strength c) Modulus of Elasticity
10. Explain types of concrete.
11. Explain procedure for determination of compressive strength of concrete.
12. What is durability of concrete? State factors affecting on it.
13. Define impermeability of concrete. Enlist factors affecting it.
14. Write a short note on High Performance Concrete.
15. Differentiate between High Performance Concrete & High Strength Concrete.

Module 05

1. Explain Creep of concrete and relation between creep and time.
2. How the shrinkage of concrete is classified and explain each one of them briefly?
3. Define: a) Creep of Concrete b) Shrinkage of Concrete
4. Explain types of Shrinkage and their Control.
5. What is creep? Explain factors affecting on Creep.
6. What is Durability of Concrete? Explain factors affecting on it.
7. Explain Alkali Aggregate Reaction (AAR) in detail.
8. State Minimum & Maximum Cement Content for different exposure condition.
9. State Factors Contributing to Cracks in Concrete.
10. Write a short note on Sulphate Attack.
11. What is Alkali Aggregate Reaction? States its deteriorating effects.
12. What is shrinkage? Explains its types.
13. Explain Creep of concrete and relation between creep and time.
14. Write a short note on chloride attack of steel.
15. Explain Relationship between Strength & Durability.

Module 06

1. Design a concrete mix of M20 grade for a roof slab. Take a standard deviation of 4MPa. The specific gravities of Coarse Aggregate and Fine Aggregate are 2.67 and 2.73 respectively. The

bulk density of coarse aggregate is 16020 Kg/m³ and Fineness Modulus of Fine Aggregate is 2.76. A slump of 50mm is necessary. The water absorption of coarse aggregate is 1% and free moisture in fine aggregate is 3%. Design the concrete mix using ACI method. Assume any missing data suitably.

2. Explain the mix design procedure of concrete as per ACI code Method.
3. Design a M35 concrete mix using IS method of Mix Design for the following data:
 - Maximum size of aggregate - 20mm (Angular)
 - Degree of workability - 0.90 compaction factor.
 - Quality control - good
 - Type of exposure - mild
 - Specific Gravity A. Cement - 3.12 (B. Sand - 2.63 (C. Coarse aggregate - 2.66
 - Water absorption: A. Coarse aggregate - 0.5% B. Fine aggregate - 1.0%
 - Free surface moisture: (A. Coarse aggregate - Nil (B. Fine aggregate - 2.2% 8)Sand confirms to Zone I grading. Assume any other data required suitably.
4. Design a M30 concrete mix using IS method of Mix Design for the following data:
 - Maximum size of aggregate - 20mm (Angular).
 - Degree of workability - 0.90 compaction factor.
 - Quality control - good
 - Type of exposure - severe
 - Specific Gravity: A. Cement - 3.10 B. Sand - 2.68 C. Coarse aggregate - 2.69
 - Water absorption: A. Coarse aggregate -1.0% B. Fine aggregate - 2.0%
 - Free surface moisture: A. Coarse aggregate- Nil B. Fine aggregate- 2.0%
 - Sand confirms to zone III grading. Assume any other data required suitably
5. Design a M40 concrete mix using IS method of Mix Design for the following data:
 - Maximum size of aggregate - 20mm (Angular).
 - Degree of workability - 0.90 compaction factor.
 - Quality control - good
 - Type of exposure - severe
 - Specific Gravity: A. Cement - 3.15 B. Sand - 2.68 C. Coarse aggregate - 2.71
 - Water absorption: A. Coarse aggregate -1.0% B. Fine aggregate - 2.0%
 - Free surface moisture: A. Coarse aggregate- Nil B. Fine aggregate- 2.0%
 - Sand confirms to zone III grading. Assume any other data required suitably.
6. Define the term “Mix Design of Concrete” and explain its significance.
7. Brief explains about factors affecting choice of mix design.
8. Explain quality control of concrete and durability of concrete.
9. Explain the mix design procedure of concrete as per IS code Method.
10. What are the variable factors to be considered in connection with specifying a concrete mix?
11. What is meant by statistical quality control?
12. What is meant by grading of aggregates?
13. What are the defects of the currently used method of mix proportioning in India? How can it be made more scientific?
14. List the methods used for mix proportioning indicating the drawbacks of each method.
15. Explain the importance of the maximum size of aggregate for normal-strength concrete mix design.

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