

GUJARAT TECHNOLOGICAL UNIVERSITY

DI -5 SEMESTER – OLD PAPER – W23 TO S25 – QUESTION BANK(English)

Subject Name & Code:

Concrete Technology- 4350601

Unit I: Cement, Aggregates and Water

Repeated Questions:

1. **Explain the functions of Bogue's compounds.**
 - Appeared in: W24 (Q1a, 03 marks), W23 (Q1a, 03 marks)
2. **Enlist the tests on cement as per BIS and explain any one in detail.**
 - Appeared in: W24 (Q1c, 07 marks), W23 (Q1c, 07 marks)
3. **Enlist the tests on aggregate as per BIS and explain any one in detail.**
 - Appeared in: W24 (Q1d, 07 marks), S25 (Q1c(OR), 07 marks) *[Note: S25 specifically asks for Aggregate Abrasion Value Test]*
4. **Explain Segregation and Bleeding in concrete.**
 - Appeared in: S25 (Q2b(OR), 04 marks), S24 (Q2b(OR), 04 marks), W23 (Q2c, 07 marks)

Other Important Questions:

5. **Describe the quality requirements of mixing water to be used in concrete with permissible limits as per IS.**
 - Appeared in: S24 (Q1a, 03 marks)
6. **Explain different types of cement with their suitable use and physical properties as per IS.**
 - Appeared in: S24 (Q1c, 07 marks)
7. **Explain the experiment to determine the flakiness and elongation index of coarse aggregate.**
 - Appeared in: S24 (Q1c(OR), 07 marks)
8. **What is the difference between setting of cement and hardening of cement?**
 - Appeared in: S25 (Q1a, 03 marks)
9. **State the functions of the following admixtures: (i) Accelerators, (ii) Air-entraining agents, (iii) Pozzolana, (iv) Plasticizers.**
 - Appeared in: S25 (Q1b, 04 marks)

10. Distinguish between gap grading and normal grading of aggregates.

- Appeared in: S25 (Q1c, 07 marks)

11. Explain 'Polymer Concrete'.

- Appeared in: W23 (Q1b, 04 marks)

12. Explain physical properties of the coarse aggregate and classification based on shape and texture.

- Appeared in: W23 (Q1d, 07 marks)

13. How does the quality of water affect concrete?

- Appeared in: S25 (Q1c, 07 marks)

Unit II: Fresh Concrete

Repeated Questions:

1. **Explain factors affecting workability.**
 - Appeared in: W24 (Q2b, 04 marks), S24 (Q2b, 04 marks), W23 (Q2a, 03 marks)
2. **Enlist various tests for workability and explain any one.**
 - Appeared in: W24 (Q2c, 07 marks), S24 (Q2a, 03 marks for Slump Test), S24 (Q2a(OR), 03 marks for Compaction Factor Test)
3. **Explain different methods of curing.**
 - Appeared in: W24 (Q2f, 07 marks), S24 (Q2c(OR), 07 marks)
4. **Explain methods of transportation of concrete.**
 - Appeared in: W24 (Q2d, 03 marks), W23 (Q2e, 07 marks)

Other Important Questions:

5. **Describe the properties of fresh concrete.**
 - Appeared in: S25 (Q2a, 03 marks)
6. **Briefly explain the flow test for workability.**
 - Appeared in: S25 (Q2b, 04 marks)
7. **State the difference between volumetric batching and weigh batching.**
 - Appeared in: S25 (Q2a(OR), 03 marks)
8. **Outline the key reasons for segregation and bleeding in concrete.**
 - Appeared in: S25 (Q2b(OR), 04 marks)
9. **Show suitable methods of compaction of fresh concrete for different concrete sections.**
 - Appeared in: S24 (Q2c, 07 marks)
10. **Explain the need for curing.**
 - Appeared in: W23 (Q2b, 04 marks)
11. **Explain the various stages from manufacturing to finishing of concrete on site.**
 - Appeared in: W24 (Q1e, 03 marks)
12. **Match the following terms related to fresh concrete (e.g., Workability, Curing, Underwater Concreting) with their correct descriptions.**
 - Appeared in: S25 (Q2c, 07 marks)

Unit III: Hardened Concrete

Repeated Questions:

1. **Define Creep and list out the factors affecting it.**
 - Appeared in: S25 (Q3b, 04 marks), W24 (Q3b, 04 marks)
2. **Explain the Split Tensile Strength test.**
 - Appeared in: W24 (Q3b, 04 marks), S24 (Q3a, 03 marks)
3. **Explain factors affecting the compressive strength of concrete.**
 - Appeared in: W24 (Q3c, 07 marks), S24 (Q3b, 04 marks)
4. **What is Non-Destructive Testing (NDT)? Enlist different methods of NDT.**
 - Appeared in: W24 (Q3a(OR), 03 marks), S24 (Q3c(OR), 07 marks)

Other Important Questions:

5. **Provide a brief note on the flexural strength of concrete.**
 - Appeared in: S25 (Q3a, 03 marks)
6. **Provide a brief note on the bond strength of concrete.**
 - Appeared in: S25 (Q3a(OR), 03 marks)
7. **State whether the following statements are True or False and correct the false ones.** (Covers topics like NDT, UPV test, bond strength, shrinkage, specimen strength, temperature, and hot weather concreting).
 - Appeared in: S25 (Q3c, 07 marks)
8. **Describe the Flexure test of concrete with beam specimens.**
 - Appeared in: S24 (Q3a(OR), 03 marks)
9. **Explain factors affecting shrinkage of concrete.**
 - Appeared in: S24 (Q3b(OR), 04 marks)
10. **Describe the importance of NDT and explain the Rebound Hammer test in detail.**
 - Appeared in: S24 (Q3c(OR), 07 marks)
11. **Explain the Ultrasonic Pulse Velocity test and its purpose.**
 - Appeared in: S25 (Q3c(OR), 07 marks)
12. **Differentiate between fresh concrete and hardened concrete.**
 - Appeared in: W23 (Q3d, 04 marks)
13. **Explain the permeability of concrete.**
 - Appeared in: W23 (Q3f, 07 marks)

Numerical Questions:

14. The following are compressive strength test results in N/mm^2 . Find mean strength, standard deviation, and coefficient of variance.

- **Data 1:** 27, 24, 28, 23, 26, 22, 25
 - Appeared in: S25 (Q3b(OR), 04 marks)
- **Data 2:** 17.0, 16.5, 16.2, 16.0, 15.8, 15.5, 15.0, 14.75, 14.20, 14.0
 - Appeared in: W24 (Q3e(OR), 07 marks)

Unit IV: Concrete Mix Design

Repeated Questions:

1. **Design a concrete mix using the IS method for given data.**
 - This is a **highly repeated and crucial numerical problem.**
 - Appeared in: S25 (Q4c, 07 marks), S24 (Q4c, 07 marks), S24 (Q4c(OR), 07 marks), W24 (Q4c(OR), 07 marks)
2. **Enlist different methods of Mix Design.**
 - Appeared in: W24 (Q4a(OR), 03 marks), S25 (Q4a(OR) MCQ, 03 marks)
3. **Differentiate between nominal mix and designed mix.**
 - Appeared in: S24 (Q4a, 03 marks), S25 (Q4a(OR), 04 marks for Ordinary vs Special Concrete which implies mix design knowledge)

Other Important Questions:

4. **Elaborate on the concepts of characteristic strength and target mean strength.**
 - Appeared in: S25 (Q4a, 03 marks)
5. **Explain the factors affecting the mix design of concrete.**
 - Appeared in: W24 (Q4c(OR), 07 marks)
6. **Enlist the factors influencing the choice of mix design and state the effect of size and shape of aggregates in the mix design.**
 - Appeared in: S25 (Q4c(OR), 07 marks)
7. **Explain the advantage of weight batching over volume batching.**
 - Appeared in: S24 (Q4a(OR), 03 marks)
8. **Answer the following multiple choice questions.**
 - i. Minimum grade of concrete for construction in sea water.
 - ii. Another name for the Grading curve method.
 - iii. Relationship between cylindrical and cube strength of concrete.
 - Appeared in: S25 (Q4a(OR), 03 marks)

Unit V: Chemical Admixture, Special Concrete and Modern Trends

Repeated Questions:

1. **Explain Plasticizers and Superplasticizers.**
 - Appeared in: W24 (Q5b, 03 marks), S25 (Q1b, 04 marks - function of plasticizers)
2. **Write a short note on modern trends and research in concrete technology.**
 - Appeared in: S25 (Q5b, 04 marks), W24 (Q4b(OR), 04 marks - on recycled concrete)
3. **Write a short note on / Explain: 3D Printed Concrete.**
 - Appeared in: W24 (Q1b, 04 marks), W23 (Q5b(OR), 04 marks)

Other Important Questions:

4. **Write a short note on: Ferrocement.**
 - Appeared in: S25 (Q4b, 04 marks)
5. **State the difference between Ordinary concrete and Special Concrete.**
 - Appeared in: S25 (Q4b(OR), 04 marks)
6. **Explain types of admixtures for improving workability.**
 - Appeared in: S24 (Q4b, 04 marks)
7. **Explain types of admixtures for improving strength.**
 - Appeared in: S24 (Q4b(OR), 04 marks)
8. **Explain Ready Mixed Concrete (RMC) in detail.**
 - Appeared in: S24 (Q1b, 04 marks)
9. **Explain Recycled Aggregate Concrete in detail.**
 - Appeared in: S24 (Q5c, 07 marks)
10. **Explain Self Compacting Concrete (SCC) in detail.**
 - Appeared in: S24 (Q5c(OR), 07 marks)
11. **Give causes of corrosion of reinforcement in concrete and its remedial measures.**
 - Appeared in: W24 (Q5c, 07 marks), W23 (Q5c(OR), 05 marks)
12. **Give your suggestions to prevent deterioration of concrete.**
 - Appeared in: W24 (Q5a(OR), 03 marks)

Unit VI: Repairs, Rehabilitation and Retrofitting of Concrete Structure

Repeated Questions:

1. **Explain the stages/process of repair and rehabilitation.**
 - Appeared in: S25 (Q5c(OR), 07 marks), S24 (Q5b(OR), 04 marks), W23 (Q5e, 07 marks)
2. **Explain crack repair methods (e.g., Epoxy Grouting, Routing and Sealing).**
 - Appeared in: S24 (Q5c, 07 marks - Epoxy Grouting), W23 (Q5a(OR), 03 marks - Routing and Sealing), W24 (Q5a, 03 marks - repairs of cracks)
3. **Define/Writes short note on: Repair, Rehabilitation, and Retrofitting.**
 - Appeared in: S25 (Q5c, 07 marks), S25 (Q5a(OR), 03 marks - destress)

Other Important Questions:

4. **Enlist repair materials and explain any one in detail.**
 - Appeared in: S25 (Q5a, 03 marks)
5. **Define destress and enlist the causes for destress in concrete.**
 - Appeared in: S25 (Q5a(OR), 03 marks)
6. **Define repair, rehabilitation, and retrofitting and explain the Base Isolation method of retrofitting with a neat sketch.**
 - Appeared in: S25 (Q5c, 07 marks)
7. **Explain retrofitting by bracing and jacketing.**
 - Appeared in: S24 (Q5a(OR), 03 marks)
8. **Describe the grouting technique for repair of concrete.**
 - Appeared in: S24 (Q5a, 03 marks)
9. **Explain types of concrete deterioration (cracks) and measures to prevent them.**
 - Appeared in: S24 (Q5b, 04 marks)
10. **Explain the application of smart technology in concrete.**
 - Appeared in: S25 (Q5b(OR), 04 marks)
11. **Enlist the details of common types of concrete admixtures.**
 - Appeared in: W24 (Q5b, 03 marks)
