

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VI EXAMINATION – WINTER 2025****Subject Code:3150610****Date:19-11-2025****Subject Name: Concrete Technology****Time: 10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- Q.1** (a) How do you ensure that quality of water is satisfactory for concrete works? **3**
- (b) Explain the role of each Bogue's compound in the process of hydration of cement. **4**
- (c) Determine the fineness modulus of the coarse aggregate for which sieve result is as shown below. Sample taken = 3000 g. **7**

Sieve size (mm)	80	40	20	16	10	4.75	2.36	1.18	0.6	0.3	0.15
Weight retained (g)	0	0	2622.50	349.25	28.25	0	0	0	0	0	0

- Q.2** (a) How is aggregate classified according to: (a) size, (b) shape and (c) texture? **3**
- (b) What are mineral admixtures? Why are they generally used? List various mineral admixtures used with concrete. **4**
- (c) In a mix design, the following results are obtained: Water = 185 kg, Fine Aggregate (FA) = 778 kg, and Coarse Aggregate (CA) = 1024 kg. If FA at site is found to contain 2% moisture and CA contains 1% moisture, determine the correct weight of Water, FA and CA. **7**

OR

- (c) What is meant by shrinkage of concrete? Briefly discuss various types of shrinkage taking place in concrete. **7**
- Q.3** (a) When do you recommend use of lightweight and heavy-weight aggregates? **3**
- (b) What is fly ash? Explain its use as admixture in making concrete. **4**
- (c) Explain the term durability of concrete and explain the factors influencing it. **7**

OR

- Q.3** (a) What is compaction of concrete? Why it is necessary? **3**
- (b) Write explanatory notes on pervious concrete. **4**
- (c) Briefly explain the wet process of cement manufacture. **7**
- Q.4** (a) After designing concrete mix for first trial, how do you proceed to finalize the mix with further trial? **3**
- (b) Explain the term permeability of concrete and its effect on concrete. **4**
- (c) State the steps involved in designing concrete mixes as per IS:10262. **7**

OR

- Q.4** (a) Explain about segregation of concrete. **3**
- (b) List various precautions to be taken during underwater concreting. **4**
- (c) What do you understand by creep of concrete? Discuss the factors affecting creep of concrete. **7**
- Q.5** (a) Explain different types of slump with sketch. **3**
- (b) What is curing? Explain its importance. **4**

(c) Define workability and explain various factors influencing workability. 7

OR

Q.5 (a) Explain about grading of aggregate and its significance. 3

(b) Explain mechanism of sulphate attack on concrete. 4

(c) Explain the basic principle on which rebound hammer works. What are its limitations? 7

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2024

Subject Code:3150610

Date:28-11-2024

Subject Name:Concrete Technology

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

	Marks
Q.1 (a) Explain the roles of each ingredient used in concrete.	03
(b) Explain the function of Bogue's compound in the hydration process of cement.	04
(c) Discuss the step-by-step procedure of concrete mix design as per IS:10262.	07
Q.2 (a) Differentiate between initial setting time and final setting time of cement, and explain their significance in construction.	03
(b) Discuss the role of plasticizers in concrete and their effect on workability.	04
(c) Enlist different types of cement used in construction and explain any three types concerning to their applications and advantages.	07
OR	
(c) Explain the step-by-step dry process of manufacturing of Ordinary Portland Cement using a flow chart.	07
Q.3 (a) Explain Slump cone test for measuring the workability of concrete.	03
(b) Discuss different methods of curing of concrete.	04
(c) Explain various factors affecting the workability of concrete in detail.	07
OR	
Q.3 (a) Explain the causes and prevention of segregation of concrete.	03
(b) Enlist various methods of concrete compaction and explain their importance.	04
(c) What is Slump loss? Discuss various measures to control slump loss in concrete.	07
Q.4 (a) Discuss various types of shrinkage of the concrete.	03
(b) Enlist various non-destructive tests of concrete and explain any one in detail.	04
(c) Explain the procedure for performing a compressive strength test on concrete cubes.	07
OR	
Q.4 (a) Explain the impact of aggregate grading on the compressive strength of concrete.	03
(b) Discuss various factors that influence the durability of concrete.	04
(c) Explain various factors affecting the compressive strength of concrete in detail.	07
Q.5 (a) How does the marine environment affect the durability of concrete?	03
(b) Write and short not on ready-mix concrete.	04

- (c) Enlist various admixtures used in the concrete. Explain any two admixtures in detail. **07**

OR

- Q.5** (a) Explain the role of gypsum in the hydration process of cement. **03**
(b) Write a short note on lightweight concrete **04**
(c) Explain the precautions that should be taken during concreting in hot and cold weather conditions **07**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2023****Subject Code:3150610****Date:07-12-2023****Subject Name:Concrete Technology****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- Q.1**
- (a) Explain the precautions to be taken in storing cement. **03**
- (b) Explain the role of each Bogue's compound in the process of hydration of cement. **04**
- (c) Briefly explain the wet process of manufacture of cement. **07**

- Q.2**
- (a) Write a brief note on: (a) Natural aggregates (b) Artificial aggregates (c) Recycled aggregates. **03**
- (b) Distinguish between OPC and PPC. **04**
- (c) How does strength of aggregate influence the strength of concrete? With a typical stress-strain curve for aggregate, concrete and cement paste illustrate the influence. **07**

OR

- (c) Determine the fineness modulus of the sand for which sieve result is as shown below: **07**

I.S. sieve size	10 mm	4.75 mm	2.36 mm	1.18 mm	0.600 mm	0.300 mm	0.150 mm	0.075 mm
Percentage passing	100	90	78	56	28	10	8	6

- Q.3**
- (a) Explain the terms 'flakiness index' and 'elongation index' as applied to coarse aggregates. **03**
- (b) Explain the test to determine crushing value of aggregates. **04**
- (c) What are mineral admixtures? Why are they generally used? List various mineral admixtures used with concrete. **07**

OR

- Q.3**
- (a) State the functions of water in making concrete. **03**
- (b) Differentiate between high-strength concrete and high-performance concrete. **04**
- (c) In a mix design, the following proportion (in kg per m³ of concrete) is arrived at: Water: Cement: FA: CA = 185: 370: 778: 1024. If fine aggregate at site is found to contain 2% moisture and coarse aggregate contains 1% moisture, determine the correct proportion to be used at site. **07**

- Q.4**
- (a) After designing concrete mix for first trial, how do you proceed to finalize the mix with further trial? **03**
- (b) Write explanatory notes on no-fines concrete. **04**
- (c) State factors affecting compressive strength of concrete and explain any one in detail. **07**

OR

- Q.4**
- (a) What precautions will you take, if concreting is to be done above 40°C? **03**
- (b) Explain segregation of concrete in detail. **04**
- (c) List various methods of concreting under water and explain 'tremie' method. **07**

- Q.5** (a) What is shrinkage? Give the classification of shrinkage. **03**
(b) Define workability and discuss factors affecting workability. **04**
(c) What is self-compacting concrete? And what are the advantages and disadvantages of using it? **07**

OR

- Q.5** (a) Explain mechanism of sulphate attack on concrete. **03**
(b) Discuss the effect of freezing and thawing on concrete. **04**
(c) Explain the basic principle on which rebound hammer works. What are its limitations? **07**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2022****Subject Code:3150610****Date:06-01-2023****Subject Name:Concrete Technology****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Explain segregation and bleeding of concrete. **03**
(b) Explain volume batching and weigh batching for concrete mix. **04**
(c) Write down the factors affecting the strength of concrete & explain any three in detail. **07**

- Q.2** (a) Write chemical composition of Ordinary Portland cement. **03**
(b) Define the term “Bulking of fine aggregates”. Explain its significance for in relation to strength of concrete. **04**
(c) Explain the Alkali-aggregate reaction. **07**

OR

- (c) List factors affecting the permeability of concrete. Explain any three of them in detail. **07**

- Q.3** (a) What do you understand by compaction of concrete? Explain “Why compaction is needed?” **03**
(b) Write short note on cold weather concreting. **04**
(c) Define durability of concrete? Enlist factors affecting durability of concrete. Explain any three in brief. **07**

OR

- Q.3** (a) What is the role of fly ash in cement industry. **03**
(b) How can we check cement on site? Why the field testing of cement is important? **04**
(c) Enlist various Non-Destructive tests for assessment of strength of concrete. Explain Rebound Hammer test. **07**

- Q.4** (a) Explain in brief about freezing and thawing effect of concrete. **03**
(b) Describe the effect of size, shape, texture and grading on concrete. **04**
(c) Explain wet process for manufacturing of cement. **07**

OR

- Q.4** (a) Describe the effect of quantity of Gypsum in cement. **03**
(b) Explain different types of slump with appropriate figure. **04**
(c) Describe shrinkage of concrete. Giving the classification of shrinkage, explain harmful effects of shrinkage of concrete. **07**

- Q.5** (a) Briefly explain Gel-space ratio. **03**
(b) List various crack repair techniques and explain any one in detail. **04**
(c) Write importance of curing of concrete. Explain different methods of curing procedure. **07**

OR

- Q.5** (a) Explain Impact and crushing value of aggregate. **03**
(b) Write a note on “Fiber reinforced concrete”. **04**

- (c) What do you mean by Design of concrete mix. Explain the steps for Mix Design Procedure as per relevant Indian Standards. **07**
