Seat No.: _____ Enrolment No._____

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 m^3 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**

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