Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–IV • EXAMINATION – WINTER • 2014

Subject Code: X40602 **Date: 29-12-2014**

Subject Name: Concrete Technology

Time: 02:30 pm - 05:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Define Coarse and fine aggregates Explain the role of aggregates in Fresh and Hardened concrete. **07**

(b) Define Heat of hydration. Explain the Structure of the Hydrated cement. **07**

Q.2 **(a)** Which are the various raw materials used for making concrete. List out the steps of manufacturing of concrete. **07**

(b) List out the raw materials required for making cement. Explain any one process of manufacturing of cement in detail. **07**

OR

(b) Differentiate between the following: (a) Initial setting time & final setting time of cement (b) Stiffening of cement & Hardening of cement. **07**

Q.3 **(a)** Which are the various laboratory tests performed on Fresh Concrete. Explain the Compaction factor test in detail with proper figure. **07**

(b) Define Workability of concrete. Explain the various factors that influence workability **07**

OR

Q.3 **(a)** Define Fineness Modulus. Find the fineness modulus of the aggregates for the given sieve analysis result. Also comment on what does the result indicates. **07**

IS sieve size	10 mm	4.75 mm	2.36 mm	1.18 mm	600 µm	300 µm	150 µm	75 µm
Percentage passing	100	92	74	55	23	12	9	7

(b) Explain the Bulking of sand in detail. If the sand is measured by volume and no allowance is made for bulking of sand, what will be its effect on a nominal concrete mix 1:2:4 for a bulking of 15%. **07**

Q.4 **(a)** Why do we need to compact the concrete. Explain the various methods of compacting the concrete. **07**

(b) Define the following: **07**

1. M20 grade of concrete
2. 43 grade cement
3. Duff Abram's Law
4. 20 mm aggregate
5. 28 day strength of concrete
6. Bulk Density
7. Specific gravity

OR

Q.4 **(a)** Explain Grading of aggregates. Explain the sieve analysis test in detail. **07**

Q.4	**(b)**	Define Non Destructive testing of Concrete. Explain any one NDT in detail	**07**
Q.5	**(a)**	What leads to cracking of concrete. Explain Carbonation and corrosion of concrete in this context.	**07**
	(b)	Write down the various steps of Concrete mix design as per IS method	**07**

OR

Q.5	**(a)**	Write short notes on the following (any four)	**14**

1) Methods of curing the concrete
2) Segregation and bleeding
3) Physical tests on aggregates
4) Admixture of your choice
5) Compare strength cube & cylindrical specimen under compression
6) Cement of your choice
7) Special concreting techniques
8) Standard consistency of cement.

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