Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - IVth Semester–Examination – May- 2012

Subject code: X40602

Subject Name: Concrete Technology

Date:09/05/2012 **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)**	What is cement. What are the functions of cement. Explain in detail the 2 main types of cement.	**07**
	(b)	State in detail the chemical composition of Portland Cement. Explain the manufacturing process of cement.	**07**
Q.2		Explain briefly **(any Two)**	**04**
	(a)	1. Standard Consistency of Cement 2. Fineness Modulus of Aggregate 3. Duff Abram's Law 4. Durability of concrete	
	(b)	Enlist the various physical properties of aggregates.	**03**
	(c)	What do you mean by Non Destructive Testing. Explain any one of the NDT test in detail	**07**
		OR	
	(c)	Enlist various Moisture conditions of aggregates. Explain each one in detail. Also explain Bulking of sand and its effects.	**07**
Q.3	**(a)**	What do you understand by workability of concrete mix? Give details of parameters affecting workability.	**07**
	(b)	Explain in detail the Compression test on concrete cubes. Also comment on the failure of compression specimen and comparison of cube and cylinder strength.	**07**
		OR	
Q.3	**(a)**	Enlist the various tests available to measure workability. Explain any one of the tests in detail.	**07**
	(b)	What do you understand by Alkali aggregate reaction. Explain the factors promoting the Alkali aggregate reaction.	**07**
Q.4	**(a)**	State the type of cement you will use for each structure mentioned below: 1. Dams. 2. Under water constructions. 3. Marine Works 4. Road repair works	**04**
	(b)	How is the field testing of cement carried out.	**03**
	(c)	Enlist the various signs of deterioration/distress in concrete structures. Explain Permeability and porosity of concrete.	**07**
		OR	
Q.4	**(a)**	Define the below: 1. Setting time of cement 2. Heat of Hydration 3. Creep 4. Gel – space ratio	**04**
	(b)	Explain the repairing process using the Injection grouting technique.	**03**
	(c)	Explain Carbonation and Chloride ingress i.e Corrosion formation in concrete in detail.	**07**
Q.5	**(a)**	Enlist various data required to design a concrete mix. Explain importance of	**07**

various factors affecting the concrete mix design method

(b) What is the water requirement for complete hydration of cement. What happens if the excess water than required is used. **07**

OR

Q.5 **(a)** Write Short Notes on below **(any Two)**

1. Classification of aggregates 2. Curing methods of concrete 3. Grading of aggregates 4. Determination of Tensile strength of concrete. **04**

(b) State the difference between the following: (Any Three) **03**

1. Mortar and Concrete
2. 43 grade cement and Mix M20
3. Initial setting time and Final setting time of cement.
4. Segregation and Bleeding
5. Voids and Crack

(b) Explain various tests to assess the strength of aggregates. Explain briefly aggregate crushing value and aggregate Impact value **07**

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