

GUJARAT TECHNOLOGICAL UNIVERSITY**BE SEM-III Examination May 2012****Subject code: 130605****Subject Name: Concrete Technology****Date: 08/05/2012****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) Draw flow chart and explain manufacturing of cement by wet process. **07**
(b) What are the major Bogue's compounds of cement? Discuss their role in hydration of cement. **07**

- Q.2** (a) Give the classification of aggregate based on shape. **07**
(b) What is bulking of sand? How it is determined in laboratory? **07**

OR

- (b) Describe aggregate impact value test. **07**

- Q.3** (a) Explain methods of transporting concrete. **07**
(b) Differentiate between volume batching and weigh batching in concrete mix procedure. **07**

OR

- Q.3** (a) Explain rebound hammer test. **07**
(b) Write short note on fiber reinforced concrete. **07**

- Q.4** (a) What is effect of freezing and thawing on concrete? **07**
(b) Write short note on acid attack on concrete. **07**

OR

- Q.4** (a) Explain vacuum concreting technique. **07**
Q.4 (b) Define creep. Explain factors affecting on creep. **07**

- Q.5** (a) What are the factors affecting on choice of mix design? **07**
(b) Explain crack repair by routing and sealing. **07**

OR

- Q.5** (a) Explain adverse effect of excessive use of admixtures. **07**
(b) Using IS method of mix design, find out proportions of concrete for following data: **07**

Grade of Concrete: M 25

Degree of Control: Good

Maximum size of Aggregate: 20 mm

Specific gravity of Cement: 3.15

Specific gravity of FA: 2.62

Specific gravity of CA: 2.64

Condition of Exposure: Moderate

Workability: 0.90 CF

Note: 5% of the low results are acceptable and W/C ratio for 28 days strength of concrete is 0.49. Refer table 1 to 6.

Table – 1: Suggested value of standard deviation

Grade of Concrete	Standard Deviation for Different Degree of Control		
	Very good	Good	Fair
M 10	2.0	2.3	3.3
M 15	2.5	3.5	4.5
M 20	3.6	4.6	5.6
M 25	4.3	5.3	6.5
M 30	5.0	6.0	7.0

Table – 2 Value of ‘t’

Accepted Proportion of Low Results	Value of ‘t’
1 in 5	0.84
1 in 10	1.28
1 in 15	1.5
1 in 20	1.65
1 in 40	1.86
1 in 100	2.33

Table – 3 Values of W/C ratio and compressive strength

Compressive Strength in N/mm ² at 28 days	W/C ratio
20	0.600
25	0.525
30	0.480
35	0.420
40	0.375
45	0.335

Table – 4 W/C ratios as per Durability Requirements

Exposure Condition	Maximum W/C ratio
Mild	0.65
Moderate	0.55
Severe	0.45

Table – 5 Approximately sand and water content per m³ of concrete for grade up to M 35

Nominal maximum size of aggregate mm	Water content per meter cube of concrete in kg	Sand as % of total aggregate by absolute volume
10	208	40
20	186	35
40	165	30

Table – 6 Approximate Air Content

Nominal Maximum size of Aggregate mm	Entrapped air as % of volume of concrete
10	3.0
20	2.0
40	1.0
