

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III • EXAMINATION – WINTER 2013****Subject Code: 130605****Date: 26-11-2013****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) What is workability? Explain compaction factor test to measure workability. **07**
(b) Explain various types of vibrator used for compaction. **07**

- Q.2** (a) Explain cracks repair by injection grouting. **07**
(b) What is initial and final setting time of cement? Explain test for the same. **07**

OR

- (b) Explain in brief calcium silicate hydrates and calcium aluminate hydrates. **07**

- Q.3** (a) Explain methods of measurement of moisture content in aggregate. **07**
(b) Give purpose of using admixtures in concrete. **07**

OR

- Q.3** (a) What are the effects of impurities in water on concrete? **07**
(b) Write short note on silica fume. **07**

- Q.4** (a) Discuss effect of age on strength of concrete. **07**
(b) What are the factors affection on permeability? **07**

OR

- Q.4** (a) Explain ultrasonic pulse velocity test for hardened concrete. **07**
(b) Write short note on pumped concrete. **07**

- Q.5** (a) List various aggressive environment for concrete. How sulphate attack on concrete? **07**
(b) State different types of special concrete and describe aerated concrete. **07**

OR

- Q.5** (a) Describe methods of mixing of concrete in brief. **07**
(b) Design the concrete mix by using IS method. (Use Table - 1 to 5) **07**

Grade of Concrete: M30

Standard deviation: 5.3

Maximum size of aggregate: 20mm

Specific gravity of cement: 3.15

Specific gravity of fine aggregate: 2.65

Specific gravity of coarse aggregate: 2.85

Condition for exposure: Mild

Notes:

- (i) Only 5% low results accepted.
- (ii) w/c ratio from 28 days compressive strength cement.
- (iii) No correction required for water content and sand content as per zone of sand and workability.

Table – 1 Value of ‘t’	
Accepted Proportion of Low Results	Value of ‘t’
1 in 5	0.84
1 in 10	1.28
1 in 15	1.50
1 in 20	1.65
1 in 40	1.86
1 in 100	2.33

Table – 2 Values of W/C ratio and compressive strength	
Compressive Strength in N/mm ² at 28 days	W/C ratio
20	0.60
25	0.525
30	0.48
35	0.42
40	0.375
45	0.335

Table – 3 W/C ratios as per Durability Requirements	
Exposure Condition	Maximum W/C ratio
Mild	0.65
Moderate	0.55
Severe	0.45

Table – 4 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

Table – 5 Approximately sand and water content per m ³ of concrete for grade up to M 35		
Nominal maximum size of aggregate (mm)	Water content per meter cube of concrete (kg)	Sand as % of total aggregate by absolute volume
10	208	40
20	186	35
40	165	30
