

# C.U.SHAH UNIVERSITY

## Summer Examination-2016

**Subject Name: Concrete Technology**

**Subject Code: 4TE03CNT1**

**Branch: B.Tech (Civil)**

**Semester: 3**

**Date :03/05/2016**

**Time: 02:30 To 05:30**

**Marks: 70**

**Instructions:**

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.
- (5) IS 10262: 2009 is allowed.

<b>Q-1</b>	<b>Attempt the following questions:</b>	<b>(14)</b>
	a) Why gypsum is added in cement manufacturing process?	1
	b) What is the standard size of mold of compressive strength of concrete?	1
	c) What is gape grading?	1
	d) How much percentage of water is required for fully hydration of cement?	1
	e) Give the types of slump.	1
	f) Which materials are used in grouting?	1
	g) Which IS code is require for concrete mix design?	1
	h) Which IS code is used for sieve analysis of sand?	1
	i) How many zones are available as per fineness of sand?	1
	j) Give the specific gravity of cement	1
	k) 1:1.5:3 proportion is used for which concrete grade?	1
	l) What is 'Creep of concrete'?	1
	m) "sand of zone-III is coarser than Zone-I" is true or false?	1
	n) What is heat of hydration in cement?	1

**Attempt any four questions from Q-2 to Q-8**

<b>Q-2</b>	<b>Attempt all questions</b>	<b>(14)</b>
	(a) Draw flow chart and explain manufacturing of cement by wet process.	7
	(b) Write short note on fibre reinforced concrete.	7
<b>Q-3</b>	<b>Attempt all questions</b>	<b>(14)</b>
	(a) Define creep. Explain factors affecting creep.	7
	(b) Explain adverse effect of excessive use of admixtures.	7
<b>Q-4</b>	<b>Attempt all questions</b>	<b>(14)</b>
	(a) What are the Bogue's compounds of Portland cement? Explain the role of each component in details.	8



- (b) Explain alkali aggregate reaction. 6
- Q-5 Attempt all questions** (14)
- (a) List the methods of measurement of workability. Explain slump test. Also mention its range of workability of concrete for different placing condition as per IS. 8
- (b) Write short note on following: 6  
 (1) Ready mix concrete (2) light weight concrete
- Q-6 Attempt all questions** (14)
- (a) What is non-destructive testing of concrete? Explain rebound hammer test with its limitations. 8
- (b) Define segregation of concrete. Explain the factors affecting it. 6
- Q-7 Attempt all questions** (14)
- (a) Explain shrinkage and factors affecting it. 8
- (b) Define durability. Explain its significance. 6
- Q-8** 14
- Using IS method of mix design, find out proportions of concrete for following data:
- Grade of Concrete: M 30  
 Degree of Control: Very good  
 Maximum size of Aggregate: 20 mm  
 Specific gravity of Cement: 3.15  
 Specific gravity of FA: 2.60  
 Specific gravity of CA: 2.62  
 Condition of Exposure: severe  
 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 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	1.50
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 <sup>2</sup> 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 – 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 m<sup>3</sup> 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

