

Seat No.	
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S.E. (Civil Engineering) (Semester- IV) Examination, December - 2015

CONCRETE TECHNOLOGY

Sub. Code : 63346

Day and Date : Wednesday, 02-12-2015

Total Marks : 100

Time : 10.00 a.m. to 01.00 p.m.

- Instructions :
- 1) Solve all the three questions from each section
 - 2) Figures to the right indicate full marks
 - 3) Assume suitable data if necessary

SECTION-I

- Q1) a) Explain test procedure to calculate the fineness modulus of sand. [6]
 b) Enlist the types of cement. Explain any three in details. [6]
 c) Explain detailed procedure to determine Aggregate Crushing Value. [6]
- Q2) a) Explain the various methods of transportation of concrete. [8]
 b) How w/c ratio and aggregate/cement ratio influence on workability of fresh concrete. [8]
- OR
- b) What do you mean by mineral admixture? Explain in detail Fly Ash? [8]
- Q3) a) List and explain the various factors affecting the strength of concrete. [8]
 b) What is creep and shrinkage of concrete? List the factors affecting creep and shrinkage of concrete. [8]

SECTION - II

- Q4) Write short notes (any three): [18]
- a) Roller Compacted Concrete.
 - b) Cold Weather Concreting.
 - c) Geopolymer Concrete
 - d) Light-weight Concrete

P.T.O.

Q5) a) Explain effect of w/c ratio on durability and permeability of concrete. [8]

b) What are factors to be considered in concrete durability? [8]

OR

b) Explain the techniques of measuring and factors affecting measurement of Ultrasonic Pulse Velocity. [8]

Q6) Design of M40 concrete mix as per IS:10262-2009 [16]

a) Grade designation: M40

b) Type of cement: OPC 43 grade conforming to IS 8112.

c) Maximum nominal size of aggregates : 20 mm

d) Workability : 100 mm (slump)

e) Exposure condition : Severe (for reinforced concrete)

f) Specific gravity of cement: 3.15.

g) Specific gravity of Course aggregate : 2.84; Fine aggregate : 2.64.

h) Sieve analysis of Fine aggregate : Conforming to Zone I of IS:383.

Sr.No.	Nominal Maximum Size of Aggregate	Assumed Standard Deviation N/mm ²
1	M 10	3.50
2	M 15	
3	M 20	4.00
4	M 25	
5	M 30	5.00
6	M 35	
7	M 40	
8	M 45	
9	M 50	
10	M 50	

Table No.2 Maximum Water Content per Cubic Meter of Concrete for Nominal
Maximum Size of Aggregate

Sr.No.	Nominal Maximum Size of Aggregate	Maximum Water Content kg/m ³
1	10	208
2	20	189
3	40	165

Table No.3 Volume of Course Aggregate per Unit Volume of Total Aggregate for
Different Zones of Fine Aggregate

Sr.No.	Nominal Size of Aggregate	Zone IV	Zone III	Zone II	Zone I
1	10	0.50	0.48	0.46	0.44
2	20	0.66	0.64	0.62	0.60
3	40	0.75	0.73	0.71	0.69

Sl. No.	Exposure	Plain Concrete			Reinforced Concrete		
		Minimum Cement Contents kg/m ³	Maximum Free W/C ratio	Minimum Grade of Concrete	Minimum Cement Content kg/m ³	Maximum Free W/C ratio	Minimum Grade of Concrete
1	Mild	220	0.60	-	300	0.55	M 20
2	Moderate	240	0.60	M 15	300	0.50	M 25
3	Severe	250	0.50	M 20	320	0.45	M 30
4	Very Severe	260	0.45	M 20	340	0.45	M 35
5	Extreme	280	0.40	M 25	360	0.40	M 40

