SL-241

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Seat No.	

S.E. (Civil Engineering) (Semester-IV) (New) Examination, April - 2017
CONCRETE TECHNOLOGY
Sub. Code : 63346

Day and Date : Saturday, 29-04-2017 **Total Marks : 100**
Time : 10.00 a.m. to 1.00 p.m.

Instructions : 1) **All questions are compulsory.**
2) **Figures to the right indicates full marks.**
3) **Assume suitable data if necessary.**

SECTION-I

Q1) a) Explain heat of hydration and it's importance in setting. **[8]**

b) Define aggregate and classify them according to (i) size (ii) Shape (iii) source of origin and (iv) Weight criteria. **[8]**

Q2) a) Explain any two methods, equipment and advantages of transportation of concrete. **[8]**

b) What is meant by segregation and bleeding? Explain their importance in concrete. **[8]**

OR

b) Describe the mechanism of action of plasticizers with neat sketch. Mention any five Superplasticizers.

Q3) a) List the various factors affecting the strength of concrete? Describe gelspace ratio. **[9]**

b) Explain the relation between modulus of elasticity and strength of concrete. **[9]**

SECTION-II

Q4) Write short notes on (any three). **[18]**

a) High Density Concrete

b) Geopolymer Concrete

c) Fibre Reinforced Concrete

d) Self-Compacting Concrete (SCC)

P.T.O.

Q5) a) Explain the importance on minimum & maximum cement content on durability? **[8]**

b) Explain causes of Corrosion and Remedial measures. **[8]**

OR

b) What is non-destructive testing of concrete? Explain Ultrasonic pulse velocity test. **[8]**

Q6) Design a concrete mix for M30 grade of concrete for severe exposure condition for RCC work as per IS: 10262-2007 for 1 bag of cement for the following data. **[16]**

Maximum size of aggregate (Angular): 20mm

Water-Cement ratio: 0.48

Specific gravity of cement: 3.10

Specific gravity of Fine Aggregate: 2.6

Specific gravity of coarse aggregate: 2.65

Water Absorption of Fine Aggregate: Nil

Water Absorption of Coarse aggregate: 0.50%

Free surface moisture on Fine Aggregate:1%

Compaction Factor: 0.85 Targeted Slump: 50mm

Sand Zone: III

Take standard deviation: 5 and Tolerance factor: 1.65

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 Coarse Aggregate per unit Volume of Total Aggregate for Different Zones of Fine Aggregate					
Sr.No.	Nominal Size of Aggregate	ZoneIV	ZoneIII	ZoneII	ZoneI
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

Table-4 Minimum cement content and Maximum W/C ratio for 20 MSA (IS-456-2000)

Sr.No.	Exposure	Reinforced Concrete		
		Minimum Cement Content kg/m^3	Maximum free W/C ratio	MinimumGrade of Concrete
1	Mild	300	0.55	M20
2	Moderate	300	0.50	M25
3	Severe	320	0.45	M30
4	Very Severe	340	0.45	M35
5	Extreme	360	0.40	M40