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Total No. of Pages : 4

Seat No.	

S.Y. B.Tech (Civil Engineering) (CBCS)
(Semester - IV) Examination, December - 2023
PCC-CV-403 : CONCRETE TECHNOLOGY
Sub. Code : 79114

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Day and Date : Friday, 29-12-2023 **Total Marks : 70**

Time : 2.30 p.m. to 5.00 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Assume suitable data if necessary and state them clearly.**
4) **Answer shall be supported by adequate sketches.**

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SECTION - I

Q1) Attempt all questions. **[12]**

a) Enlist the types of cement. Explain any two types in detail. **[6]**

b) Explain the classification of aggregates. **[6]**

Q2) Attempt the following. **[11]**

a) Enlist the test for measurement of workability and explain compaction factor test. **[6]**

b) Explain various methods of curing of concrete. **[5]**

OR

b) Describe the various methods of mixing of concrete. **[5]**

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Q3) Attempt any two. **[12]**

a) Explain the techniques of measuring and factors affecting measurement of Ultrasonic Pulse Velocity. **[6]**

b) Explain the maturity concept of concrete? **[6]**

c) Explain how w/c ratio and gel/space ratio influence on workability of fresh concrete. **[6]**

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SECTION - II

Q4) Attempt all questions. **[15]**

a) What are the factors affecting design of concrete mix. **[5]**

b) Design of M20 concrete mix as per IS:10262-2009. **[10]**

i) Grade Designation: M20

ii) Type of cement: OPC 43 grade confirming to IS 8112

iii) Maximum nominal size of aggregate: 20 mm

iv) Workability: 100 mm slump

v) Exposure condition: Mild for R.C.C.

vi) Specific gravity of cement: 3.15

vii) Specific gravity of coarse aggregates: 2.8

viii) Specific gravity of fine aggregates: 2.7

ix) Sieve analysis of fine aggregate: Confirming to Zone I of IS: 383

Table1 : Assumed Standard Deviation

Sr. No.	Nominal size of Aggregate	Assumed standard deviation in 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 40	

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Table 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
1.	10	208
2.	20	186
3.	40	165

Table 3 :Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate

Sr. No.	Nominal Maximum 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

Table 5 : Minimum cement content, Maximum Water cement ratio and Minimum grade of concrete for Different exposures with Normal Weight aggregates of 20 mm Nominal Maximum size

Sr. No.	Exposure	Plain concrete			Reinforced concrete		
		Minimum cement content Kg/m^3	Maximum free water-cement ratio	Minimum grade of concrete	Minimum cement content Kg/m^3	Maximum free water cement ratio	Minimum grade of concrete
1	Mild	220	0.60	-	300	0.55	M20
2	Moderate	240	0.60	M15	300	0.50	M25
3	Severe	250	0.50	M20	320	0.45	M30
4	Very Severe	260	0.45	M20	340	0.45	M35

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5	Extreme	280	0.40	M25	360	0.40	M40

Q5) Attempt any Two. **[8]**

a) Explain fly ash as admixture in concrete. **[4]**

b) Explain in detail effect of super plasticizers on concrete. **[4]**

c) Write short note on Silica fuma. **[4]**

Q6) Attempt any Two. **[12]**

a) Write short notes on 1. Fiber reinforced concrete 2. Light weight concrete. **[6]**

b) Explain acid attack on concrete in detail. **[6]**

c) Write short note on durability of concrete. **[6]**

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