Seat No.

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OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Concrete Technology

Sub. Code: 63346/79114/79402

Day and Date: Tuesday ,09-12-2025 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions:
1. **All questions are compulsory**
2. **Assume suitable data wherever necessary and mention it boldly**
3. **Figures to the right indicate full marks**
4. **Use of Scientific calculator is allowed**

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

a. Write a short note on alkali aggregate reaction. **[6]**

b. Enlist the types of cement. Explain the suitability of any two types. **[6]**

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

a. Explain various methods of transportation of concrete **[6]**

b. What is meant by segregation and bleeding? Explain their importance in concrete. **[5]**

OR

c. Enlist the test for measurement of workability and explain compaction factor test. **[5]**

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

a. Explain the maturity concept of concrete. **[6]**

b. Explain how gel/space ratio affects strength of concrete. **[6]**

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

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

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

b.

Design of M30 concrete mix as per IS:10262:2009

a) Grade Designation: M30
b) Type of cement- O.P.C 43 Grade
c) Maximum nominal size of aggregate- 20 mm
d) Workability- 100 mm slump
e) Exposure- Severe for R.C.C.
f) Specific gravity of cement- 3.15
g) Specific gravity of coarse aggregate- 2.8
h) Specific gravity of fine aggregate- 2.7
i) Sieve analysis of Fine aggregate: Conforming to Zone I of IS:383

Table 1 : Assumed Standard Deviation

Sr. No.	Nominal size of Aggregate	Assumed standard deviation in N/mm²
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	

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 zise

Sr. No.	Exposure	Plain Concrete			Reinforced concrete		
		Minimum Cement content Kg/m³	Maximum free Water-cement ratio	Minimum grade of concrete	Minimum Cement content Kg/m³	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
5	Extreme	280	0.40	M25	360	0.40	M40

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

a. Write short note on GGBS. **[4]**

b. Explain in detail effect of superplasticizers on concrete. **[4]**

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

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

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

b. Write short note on **[6]**
1. Self-compacting concrete
2. High Performance concrete.

c. Explain effect of permeability on concrete. **[6]**

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (101) Bachelor of Engineering (79402) Concrete Technology Part 2 SEM 4
2] (1154) B.Tech. CBCS (79114) Concrete Technology Part 2 SEM 4
3] (101) Bachelor of Engineering (63346) Concrete Technology Part 2 SEM 4