Roll No.											

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 10- 12- 2025 **Time:** 1.00pm to 04.00pm

School: SOE	**Program:** B.Tech. Civil Engineering	
Course Code: CIV2019	**Course Name:** Advanced Concrete Technology	
Semester: V	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**16**	**24**	**20**	**16**	**24**

Instructions:

(i) Read all questions carefully and answer accordingly.
(ii) Do not write anything on the question paper other than roll number.
(iii) Use of IS10262:2019 is permitted.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	What are the important properties of cement?	**2 Marks**	**L1**	**CO1**
2.	Define hydration of cement. List the hydration products.	**2 Marks**	**L1**	**CO1**
3.	List any two advantages and disadvantages of fly ash cement.	**2 Marks**	**L1**	**CO1**
4.	Define modulus of elasticity of concrete. Calculate the modulus of elasticity of M20 grade concrete as per IS456.	**2 Marks**	**L1**	**CO2**
5.	Define the terms bleed and segregation in concrete.	**2 Marks**	**L1**	**CO2**
6.	Define workability and consistency of concrete.	**2 Marks**	**L1**	**CO4**
7.	List any four methods of compaction of concrete.	**2 Marks**	**L1**	**CO4**
8.	Classify the various techniques in under water concreting.	**2 Marks**	**L1**	**CO4**
9.	List any two differences between high strength concrete and high-performance concrete.	**2 Marks**	**L1**	**CO5**
10.	What is a geo-polymer concrete?	**2 Marks**	**L1**	**CO5**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Explain the stages of evolution of heat during hydration of cement.	**10 Marks**	**L2**	**CO1**
	b.	Outline the types of cements as per IS and mention its uses.	**10 Marks**	**L2**	**CO2**
Or					
12.	**a.**	Describe the various types of mineral admixtures used in concrete along with its application.	**10 Marks**	**L2**	**CO1**
	b.	Discuss the failure of concrete with the help of stress-strain curve.	**10 Marks**	**L2**	**CO2**

13.	**a.**	Explain the types of shrinkages in concrete.	**10 Marks**	**L2**	**CO2**
	b.	Outline the mechanism of chloride attack on concrete. List any three types of failures due to chloride attack.	**10 Marks**	**L3**	**CO3**
Or					
14.	**a.**	Explain the mechanism of creep of concrete. List any four factors influencing the creep of concrete.	**10 Marks**	**L2**	**CO2**
	b.	Outline the mechanism of sulphate attack on concrete. Name any three types of failures due to sulphate attack.	**10 Marks**	**L1**	**CO3**

15.	**a.**	Outline any four tests conducted on the fresh properties of concrete.	**10 Marks**	**L4**	**CO4**
	b.	Explain one test each to determine the water permeability and gas permeability in concrete.	**10 Marks**	**L2**	**CO3**
Or					
16.	**a.**	Write a note on slip form construction.	**10 Marks**	**L2**	**CO4**
	b.	Outline the different transport mechanisms in concrete and explain how it would affect concrete.	**10 Marks**	**L2**	**CO3**

17.	**a.**	Design mix proportion for an M80 Grade high strength high performance concrete with special requirements of high abrasion resistance using silica fume & fly ash. Data/ Stipulations: a) Grade designation: M 80	**20 Marks**	**L4**	**CO5**

		b) Type of cement: OPC53 grade conforming to IS 269 c) Silica fume: Conforming to IS 15388 d) Maximum nominal size of aggregate: 20 mm e) Exposure conditions as per Table 3 & 5 of IS 456: Severe (for reinforced concrete) f) Workability: 120 mm (slump) g) Method of concrete placing: Pumping h) Degree of supervision: Good i) Type of aggregate: Crushed angular aggregate j) Chemical admixture type: Superplasticizer (Polycarboxylate ether based)			
Or					
18.	**a.**	Design the mix proportion for SCC of M30 grade with the following stipulations. Data/ Stipulations: a) Grade designation: M 30 b) Type of cement: OPC 43 grade conforming to IS 269 c) Nominal Maximum nominal size of aggregate: 20 mm d) Exposure conditions as per Table 3 & 5 of IS 456: Severe (for reinforced concrete) e) Characteristics of SCC Slump Flow Class: SF3 (slump flow 760 mm – 850 mm) Passing ability by L box test: Ratio of h2/h1 = 0.9 V- Funnel flow time (Viscosity): Class V1 (flow time ≤ 8s) Sieve segregation resistance: SR2(<15percent) f) Degree of site control: Good g) Type of aggregate: Crushed angular aggregate h) Chemical admixture type: Superplasticizer: Normal (PCE type) i) Mineral admixture: Fly ash conforming to IS 3812 (Part 1)	**20 Marks**	**L4**	**CO5**