CBCS SCHEME

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BCV503

ACHARYA INSTITUTE OF TECHNOLOGY MCA Library Date ..... BANGALORE

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Concrete Technology

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.
3. IS 456:2000 and IS 10262 : 2019 are allowed.

			M	L	C
		Module – 1			
Q.1	a.	With flow diagram, explain the dry manufacturing process of cement.	10	L2	CO1
	b.	What are Bouge's Compounds? Explain their role in setting and hardening process of cement.	10	L2	CO1
		OR			
Q.2	a.	Discuss the manufacturing process and applications of M-sand in the construction industry. Evaluate the advantages and disadvantages compared to Natural Sand.	10	L2	CO1
	b.	What is meant by grading of aggregates? Explain the importance of size, shape and texture with respect to the course aggregate.	10	L2	CO1
		Module – 2			
Q.3	a.	Explain the process of i) Batching ii) Mixing iii) Transportation iv) Placing in the manufacturing of concrete.	10	L2	CO2
	b.	Define the workability of concrete. What are the different test methods to determine the workability of concrete? Explain any two methods.	10	L2	CO2
		OR			
Q.4	a.	What is the necessity of curing the concrete? Explain the following of curing i) Membrane curing ii) Application of Heat	10	L2	CO2
	b.	Explain segregation and bleeding. What are the effects of segregation and bleeding? How segregation and bleeding can be reduced.	10	L2	CO2
		Module – 3			
Q.5	a.	Explain the maturity concept of concrete. What are its practical uses in the concrete industry?	10	L2	CO2
	b.	Define water to cement ratio. Explain how W/C ratio affect the strength of concrete.	5	L2	CO3
	c.	Discuss the concept of Gel/Space ratio. Explain the factors influencing the strength of concrete.	5	L2	CO3

		OR			
Q.6	**a.**	Explain the concept of carbonation in concrete and its potential effects on reinforced concrete structures. Discuss the factors that influence the rate of carbonation and the measures that can be taken to mitigate its harmful effects on concert structures.	**10**	**L2**	**CO3**
	b.	Discuss about the durability of concrete in Sea water.	**10**	**L2**	**CO3**
		Module – 4			
Q.7	**a.**	Explain the concept of mix design. Explain the different methods of mix proportioning.	**12**	**L2**	**CO3**
	b.	Explain the significance of concrete mix design in modern concrete industry.	**8**	**L2**	**CO3**
		OR			
Q.8		Discuss a concrete mix by IS method for M_{30} grade concrete as per IS – 10262 – 2019.	**20**	**L2**	**CO3**

a)	Grade	:	M_{30}
b)	Cement	:	OPC 53 Grade
c)	Maximum Nominal size of Aggregate	:	20 mm
d)	Minimum cement content	:	320 Kg/m^3
e)	Maximum W/C Ratio	:	0.45
f)	Workability	:	100mm slump
g)	Exposure condition	:	Severe (Reinforced concrete)
h)	Method of concrete placing	:	Pumping
i)	Degree of supervision	:	Good
j)	Type of Aggregate	:	Crushed Angular
k)	Maximum cement content	:	450 Kg/m^3
L)	Chemical admixture	:	Super plasticizer

Test Data for Materials :

i) Specific gravity of cement = 3.15
ii) Specific gravity of C.A = 2.74
iii) Specific gravity of F.A = 2.72
iv) Water absorption for 1) C.A = 0.5% 2) F.A : 1.5%
v) Free surface moisture 1) C.A = NIL 2) F.A : 2.0%
vi) Grading of fine Aggregate : Zone III

		Module – 5			
Q.9	**a.**	Define RMC. What are the requirements of RMC? Briefly discuss the advantages and disadvantages of RMC.	**10**	**L3**	**CO4**
	b.	Define Self Compacting Concrete. Explain the properties of self compacting concrete and the need for self compacting concrete in the construction industry.	**10**	**L3**	**CO4**
		OR			
Q.10	**a.**	Explain the types of fibers used in fiber reinforced concrete and its applications.	**10**	**L3**	**CO4**
	b.	Explain the following types of special concrete characteristics and circumstances under which they are preferred. i) Geo Polymer Concrete ii) High Performance Concrete.	**10**	**L3**	**CO4**

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