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ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech / (Full Time) - END SEMESTER EXAMINATIONS, NOV / DEC 2023

CIVIL ENGINEERING

5TH Semester

CE 5031 – Concrete Technology

(Regulation 2019)



Time:3hrs

Max.Marks: 100

CO1	Have thorough knowledge of the fresh and mechanical properties of concrete
CO2	Explain the effect of admixtures on the behavior of concrete
CO3	Design concrete mix by IS method and be aware of the acceptance criteria as per code
CO4	Explore the application of special concretes for practical purpose and special concreting methods
CO5	Describe and carry out non destructive and durability test on concrete

BL – Bloom's Taxonomy Levels

(L1-Remembering, L2-Understanding, L3-Appling, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A(10x2=20Marks)

(Answer all Questions)

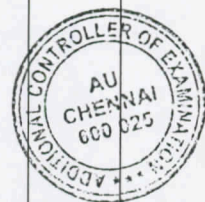
Q.No	Questions	Marks	CO	BL
1	What are Bogue's compounds?	2	1	1
2	Specify the importance of grading in concrete making.	2	1	2
3	Differentiate between plasticizers and super-plasticizers.	2	2	2
4	List any type of commercially available chemical admixtures (Two nos)	2	2	1
5	Specify the code provisions for the minimum frequency of sampling for the designed concrete mix.	2	3	2
6	Give reasons for variation in compressive strength of the samples of same mix.	2	3	2
7	What are the applications of light weight concrete?	2	4	1
8	Enumerate the parameters that affect the strengths of geo-polymer concrete.	2	4	1
9	What are the factors that influence the UPV test results?	2	5	1
10	How does exposure to chemicals impact concrete durability?	2	5	2

PART- B(5x 13=65Marks)

(Restrict to a maximum of 2 subdivisions)

Q.No	Questions	Marks	CO	BL
11 (a) (i)	Describe the measures to be taken during manufacturing to ensure the quality and consistency of concrete.	6	1	2
(ii)	Also specify the testing procedures that are employed to monitor the parameters for quality control in concrete?	7	1	2
OR				
11 (b) (i)	How does the curing process affect the strength development of concrete?	5	1	2
(ii)	Explain in detail Any Two methods to assess the concrete strength?	8	1	2

12 (a) (i)	What are the primary functions of admixtures in concrete, and how do they enhance various properties such as workability, strength, durability, or setting time (with suitable example)?	13	2	2
OR				
12 (b) (i)	Describe the different types of mineral admixtures used in concrete (Any Two). How are they classified based on their functions.	13	2	2
13 (a) (i)	<p>Design a concrete mix for reinforced concrete work for the following requirements using IS method</p> <p>Characteristic strength at 28 days : 65 MPa</p> <p>Exposure condition : Severe</p> <p>Degree of workability : slump = 105 mm</p> <p>Quality control : very good</p> <p>Cement : OPC (specific gravity = 3.15,)</p> <p>Sand : zone II (specific gravity = 2.6,)</p> <p>Coarse aggregate : max. size 20 mm (angular, specific gravity = 2.7)</p> <p>Water absorption of coarse aggregate = 1%</p> <p>Free surface moisture in sand = 2%</p> <p>Assume any data required. (Use any one supplementary mineral admixtures like flyash, GGBS etc)</p>	13	3	5
OR				
13 (b) (i)	<p>Design a concrete mix for reinforced concrete work for the following requirements using IS method</p> <p>Characteristic strength at 28 days : 35 MPa</p> <p>Exposure condition : Severe</p> <p>Degree of workability : slump = 125 mm</p> <p>Quality control : good</p> <p>Cement : OPC (specific gravity = 3.15,)</p> <p>Sand : zone III (specific gravity = 2.65,)</p> <p>Coarse aggregate : max. size 20 mm (angular, specific gravity = 2.7)</p> <p>Water absorption of coarse aggregate = 1.5 %</p> <p>Free surface moisture in sand = 0.5 %</p> <p>Assume any data required.</p>	13	3	5
14 (a) (i)	Enumerate the tests to be conducted in self compacting concrete with their permissible limits. Explain any two methods in detail.	13	4	1
OR				
14 (b) (i)	Brief the production of geo-polymer concrete and enlist the salient parameters affecting the compressive strength of geo-polymer concrete.	13	4	1
15 (a) (i)	How can the data obtained through NDT be effectively interpreted and analyzed to make informed decisions about concrete maintenance, repair, or replacement?	13	5	2
OR				
15 (b) (i)	Explain the mechanism of corrosion of reinforcement in concrete and discuss any one method of assessing the level of corrosion.	13	5	2



PART- C(1x 15=15Marks)
(Q.No.16 is compulsory)

Q.No	Questions	Marks	CO	BL
16.	Discuss the Hot Weather Concreting in detail. Explain the problems associated with it with a case study? How can be these problems overcome?	16 15	4	6

