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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E. **Semester: V**
Branch: Civil Engineering **Duration: 3 hrs.**
Course Code: 20CV5PEACT **Max Marks: 100**
Course: Advanced Concrete Technology **Date: 25.09.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.
3. Use of IS10262-2019 is permitted

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

SUPPLEMENTARY EXAMS 2023

UNIT - I

1	a)	Explain composite cement. Discuss its properties.	**05**
	b)	Explain RMC. Discuss briefly about its working operations.	**05**
	c)	Explain Pumpable Concrete. Discuss its requirements.	**10**

UNIT - II

2	a)	Explain High-Performance Concrete. List a few salient features. Also distinguish between HPC and High Strength Concrete.	**10**
	b)	What is High Density Concrete? Explain the properties of High-Density Concrete?	**10**

OR

3	a)	What are the factors affecting the strength of light weight aggregate concrete?	**10**
	b)	Explain the classification of LWC aggregates.	**10**

UNIT - III

4	a)	Explain the characteristics of FRC. List the natural and artificial fibers used for making FRC.	**10**
	b)	List the different types of fibers used in making FRC and explain any three of them.	**10**

UNIT - IV

5	a)	Explain the characteristics of SCC. List out the fresh properties of SCC and tests to determine the same along with the acceptable values as per EFNARC and ASTM guidelines.	**06**
	b)	Design M35 grade SCC mix using IS 10262-2019 guidelines for the following data: Type of Cement = OPC 53; Nominal size of aggregate = 20mm;	**14**

Exposure conditions = Mild;
Slump flow class = SF3 (slump flow 760mm to 850 mm);
Degree of site control = Good;
Type of aggregate = Crushed angular aggregate;
Total powder content = 510 kg/m3
Maximum cement content = 450 kg/m3
Chemical Admixture = PCE base superplasticizer;
Mineral admixture = GGBFS;
Specific gravity of cement = 3.15;
Specific gravity of GGBFS = 2.9;
Specific gravity of fine aggregate = 2.6 (SSD condition);
Specific gravity of coarse aggregate = 2.7(SSD condition);
Specific gravity of superplasticizer = 1.08.

OR

6	a)	Briefly explain the importance of rheological studies on fresh concrete.	**10**
	b)	What are rheometers? Mention any three types of rheometers with their advantages and disadvantages	**10**

UNIT - V

7	a)	Briefly discuss the materials used for production of Geo-Polymer concrete. Compare and discuss the same with conventional concrete.	**06**
	b)	Workout a typical mix proportion for fly-ash based GPC using NaOH and Na_2SiO_3 for a molarity of 12. Consider total water content as 150 liter / m^3. Take ratio of Na_2SiO_3 to NaOH as 2.5. Assume any suitable missing data and mention the same clearly.	**14**

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SUPPLEMENTARY EXAMS 2023