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10CV81

Eighth Semester B.E. Degree Examination, July/August 2022
Advanced Concrete Technology

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***
2. ***Use of IS : 10262 2009 is permitted.***
3. ***Missing data may be suitably assumed.***

PART – A

1 a. Name the Bogue's compounds with their typical ranges in Ordinary Portland cement. Discuss their contribution to strength and durability of concrete. **(08 Marks)**

b. Explain Rheology of concrete in terms of Bingham's parameter **(05 Marks)**

c. Discuss the factors affecting strength and durability of concrete. **(07 Marks)**

2 a. Distinguish between Accelerators and Retarders with suitable examples and applications. **(07 Marks)**

b. What is an Air Entraining Admixture? Explain the activity of Air Entraining Agent with the help of neat sketches and examples. **(07 Marks)**

c. What are Water Reducing Admixtures? How the Optimum dosage of Super plasticizer is determined? **(06 Marks)**

3 a. List out the factors upon which the design mix of concrete should be based according to IS – 465 - 2000. **(04 Marks)**

b. Design a concrete mix for M-45 grade of concrete with the following data :

i) Cement = OPC 43 grade IS 8112.
ii) Specific gravity of cement = 3.15.
iii) Maximum size of aggregate = 20mm.
iv) Exposure condition = Severe (RCC).
v) Workability = 125mm slump.
vi) Minimum cement content = 320 kg/m^3.
vii) Maximum W/C ratio = 0.45.
viii) Method of placing = Pumping.
ix) Degree of supervision = Good.
x) Specific gravity of coarse aggregate = 2.80.
xi) Specific gravity of fine aggregate = 2.70.
xii) Admixture - Super plasticizer is used .
xiii) Water absorption :
Coarse aggregate - 0.5% (grading conforms to table 2 of IS 383).
Fine aggregate - 1.0% (grading conforms to Zone – II). **(16 Marks)**

4 a. What is Alkali – Silica - Reaction? Discuss the factors affecting and control measures. **(06 Marks)**

b. What is Corrosion of steel in concrete? Explain Chloride induced type of steel corrosion and indicate the control measures. **(07 Marks)**

c. Explain Sulphate attack on concrete. List out the various control measures. **(07 Marks)**

PART – B

5 a. Sketch a typical layout of the site for RMC plant with Auxiliary. Mention the advantages of RMC. **(07 Marks)**

b. Explain Gunite and underwater concreting. **(06 Marks)**

c. What is Self Compacting Concrete? Write a note on characteristic properties required for SCC in the fresh state. Explain any one test conducted on SCC to assess its workability. **(07 Marks)**

6 a. What is Ferro cement? Explain the techniques of manufacture and applications. **(10 Marks)**

b. What is Fibre Reinforced Concrete (FRC)? Discuss the various factors affecting strength and toughness of FRC. **(06 Marks)**

c. Write a note on various types of fibres used in Fibre reinforced concrete. **(04 Marks)**

7 a. Discuss the methods of producing Light Weight Concrete (LWC). Write a note on properties and applications of Light Weight Concrete. **(12 Marks)**

b. Distinguish between High strength concrete and High Performance concrete (HPC). List out the salient High Performance requirements for HPC. **(08 Marks)**

8 Write short notes on :

a. Tests on Hardened Concrete. **(08 Marks)**

b. Rebound Hammer Test (NDT). **(06 Marks)**

c. Pulse Velocity Test (NDT). **(06 Marks)**

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