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10CV81

Eighth Semester B.E. Degree Examination, June/July 2016
Advanced Concrete Technology

Time: 3 hrs.

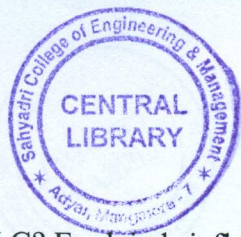
Max. Marks: 100

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

PART – A

- 1 a. Enumerate the importance of Bogue's compounds in ordinary port land cement. (06 Marks)
 b. Explain briefly rheology of concrete. What are the factors affecting the rheology of concrete? (07 Marks)
 c. What are the factors affecting strength and elasticity of concrete? (07 Marks)
- 2 a. Explain the mechanism of 'deflocculation' of cement particles by super plasticizers with neat sketches. (07 Marks)
 b. What is optimum dosage of super plasticizer? How do you determine the optimum dosage of super plasticizer? (07 Marks)
 c. What are mineral admixtures? Explain briefly, i) Silica fume ii) G.G.B.S. iii) Fly ash. (06 Marks)
- 3 a. Explain the factors affecting the mix design of concretes. (05 Marks)
 b. Design a concrete mix of M₂₅ grade for the following data:
 Max size of aggregate – 20 mm; Crushed angular
 Min/max cement content – 300/450 kg/m³; Max W/C – 0.5; Exposure condition – Moderate;
 Work ability – 100 mm slump; Method of placing – pumping; Quality control – good;
 Type of chemical admixture – Super plasticizer [Specific gravity – 1.14].
 Assume 25% replacement of cement by fly ash.
 Test data for materials:
 i) Cement – OPC 43 grade IS 8112.
 ii) Specific gravity of cement – 3.15
 iii) Fly ash – 20% Cementations material
 iv) Specific gravity of fly ash – 2.20
 v) Specific gravity of coarse aggregate – 2.60
 vi) Specific gravity of fine aggregate – 2.65
 [belongs to zone II]
 Assume any other data suitably. (15 Marks)
- 4 a. Explain the influence of w/c ratio and age on permeability of concrete. (07 Marks)
 b. Discuss in brief alkali aggregate reaction. What precautions are necessary to minimize? (06 Marks)
 c. What is sulphate attack? Explain briefly the methods of controlling sulphate attack. (07 Marks)

Important Note : 1. On completing your answers, carefully draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.



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PART – B

- 5 a. What is R.M.C? Explain briefly advantages of R.M.C. (06 Marks)
b. Explain short crete and under water concreting. (08 Marks)
c. What is self compacting concrete? What are the advantages of self compacting concrete? (06 Marks)
- 6 a. What are the different types of fibres used in concrete? What factors effecting properties of fibre reinforced concrete? (08 Marks)
b. What is aspect ratio? How does it influence strength and toughness of FRC? (04 Marks)
c. What is Ferro cement? List the various applications of Ferro cement. (08 Marks)
- 7 a. Write short notes on:
i) Light weight concrete. (06 Marks)
ii) High density concrete. (06 Marks)
b. What is 'High Performance Concrete' [HPC]? What are the applications of High Performance Concrete? (06 Marks)
c. Discuss in brief the properties of High Performance Concrete in fresh and hardened state. (08 Marks)
- 8 Explain the following:
a. Tests on hardened concrete. (08 Marks)
b. Rebound Hammer Test [NDT]. (06 Marks)
c. Pulse Velocity Test [NDT]. (06 Marks)
