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10CV81

Eighth Semester B.E. Degree Examination, June/July 2015
Advanced Concrete Technology

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART – A

- 1 a. Clearly mention the four Bogue equations used for estimating potential compound composition of Portland cement. Also mention the two basic assumptions made while developing Bogue equations. Mention its importance. (08 Marks)
- b. Write note on interfacial transition zone in concrete. (04 Marks)
- c. Draw typical stress – strain curves for concrete under :
- Biaxial compression
 - Combined compression and tension
 - Biaxial tension, and mark salient points. (08 Marks)
- 2 a. What are plasticizers? Mention the types of plasticizers. Write brief note on electro chemical activity of super plasticizers. (10 Marks)
- b. With sketch explain the activity of air – entraining agents. (05 Marks)
- c. What are mineral admixtures? Explain briefly the role of i) metakaoline ii) silica fume and iii) fly ash as mineral admixtures. (05 Marks)
- 3 a. Explain briefly the steps involved in concrete mix design as per Bureau of Indian standards. (10 Marks)
- b. Calculate :
- Water-cement ratio to achieve $f_{ck} = 20 \text{ N/mm}^2$ at 28 days assuming 30 samples with standard deviation 4.6 for 43 grade cement
 - Target strength if standard deviation is 5, for $f_{ck} = 20 \text{ N/mm}^2$. (05 Marks)
- c. Mention the relation used for calculating volume of sand and coarse aggregate as per Indian standards, by absolute volume method. (05 Marks)
- 4 a. Explain briefly thermal diffusivity and thermal conductivity. (05 Marks)
- b. Mention the Alkali Silica reaction. What circumstances are required for the Alkali Silica reaction(ASR) to take place? (05 Marks)
- c. Mention the three parameters included in the concrete work specification to ensure required impermeability of concrete. (03 Marks)
- d. Define : i) Durability ii) specific heat iii) Efflorescence. (07 Marks)

PART – B

- 5 a. Sketch a typical layout of the site for RMC plant with auxiliary. Explain any two of the auxiliary in brief. (12 Marks)
- b. Mention the various tests performed to check the properties of fresh self compacting concrete (SCC). Explain any one of them briefly, with sketches. (08 Marks)
- 6 a. Explain briefly the behavior of fibre reinforced concrete under :
- Tension
 - Compression
 - Flexure. (12 Marks)
- b. What is Ferro concrete? Mention its properties with application in civil engineering field. (08 Marks)

Important Note : 1. On completing your answers, compulsorily 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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- 7 a. Write a brief note on proportioning of light weight concrete. (04 Marks)
b. Explain briefly the salient high performance requirements to produce high performance concrete. (04 Marks)
c. What is high density concrete? Mention its properties and any four important applications. (12 Marks)
- 8 Write short notes on :
a. Pulse velocity method
b. Rheology of concrete
c. Post and pre-cracking FRC beams
d. Marsh cone test. (20 Marks)

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