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Question Paper Code : 31020

3.6.13 - A

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Seventh Semester

Civil Engineering

080100051 – CONCRETE TECHNOLOGY

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Sketch a simple flow chart to indicate the dry process of cement manufacture.
2. State the advantages and disadvantages of rounded aggregates.
3. What is a water reducing agent? How is it different from a workability agent?
4. State the characteristics of Blast Furnace Slag cement.
5. What are the various inputs required to design a mix by BIS method?
6. Define 'Useful work' with reference to workability of concrete.
7. Define bleeding of concrete. What are its effects?
8. Why is two point loading preferred while conducting flexure test on concrete specimens?
9. What is a high strength concrete? What are its applications?
10. What is SIFCON? How is it different from fibre reinforced concrete?

PART B — (5 × 16 = 80 marks)

11. (a) What is setting of cement? How is setting time determined in the laboratory? State the IS specifications for the same.

Or

- (b) What is the importance of grading on aggregates? How is the grading pattern of an aggregate sample determined?

12. (a) Explain the purpose of using accelerators and retarders. What are the various materials used? State their applications and limitations.

Or

- (b) Describe the use of Fly ash and metakaoline in concrete as admixtures bringing out clearly their application and limitations.

13. (a) Design a concrete mix for the following requirements using BIS method. Also find the mix proportions by weight and by volume.

Concrete grade — M25; Cement - OPC, Specific Gravity -3.13, Bulk density - 1460 kg/m^3 ;

Sand - Grading zone III, Specific Gravity - 2.67, Bulk density - 1600 kg/m^3 ;

Coarse aggregate - 20mm angular, Specific Gravity -2.66, Bulk density - 1540 kg/m^3 ;

Degree of workability -0.75 Compacting factor; Quality control – Good ;

Or

- (b) Design an air entrained concrete mix by ACI method for the following requirements :

Concrete grade — M30; Coarse aggregate - specific gravity 2.670, rodded density 1570 kg/m^3 , maximum size 20 mm;

Sand - Fineness modulus 2.66, specific gravity 2.66; Slump required - 100 mm.

Also find the mix proportions by volume by assuming the bulk densities of cement, sand and Coarse Aggregate as 1450, 1580 and 1460 kg/m^3 .

14. (a) State the principle and describe how a VB test is conducted on a concrete sample. How does it compare with other workability tests?

Or

- (b) How are the stress strain characteristics of concrete determined? Draw a typical stress strain curve and indicate how the various types of modulus of elasticity are found out from the curve. Mention the limitation of each type.

15. (a) What is ferrocement? How is it manufactured? Discuss its relative merits and demerits.

Or

- (b) What is shotcrete and what is its purpose? Explain the procedure of shotcreting, its application and limitations.