

## FACULTY OF ENGINEERING

**B.E. 4/4 (Civil) I – Semester (New) Examination, December 2013**

**Subject : Concrete Technology**

**Time : 3 hours**

**Max. Marks : 75**

**Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.**

### PART – A (25 Marks)

1. Explain why heat of hydration is different for OPC and PPC cements. (3)
2. Draw the stress-strain curve for concrete and explain the same for high strength and low strength concrete. (3)
3. Explain the temperature effects on strength of concrete for a particular grade. (3)
4. Give the basic physical properties required for mix design of concrete. (3)
5. Differentiate between mineral and chemical admixtures. (3)
6. Differentiate between light weight concrete and recycled concrete. (2)
7. As per Indian standards which zone of sand is more suitable for concrete construction? Why? (2)
8. Give the advantages of ready mix concrete. (2)
9. Explain the need for fibre reinforced concrete. (2)
10. Why self compacting concrete is more popular in present day scenario? Give reasons. (2)

### PART – B (50 Marks)

- 11.a) Explain any four physical properties of coarse aggregates. (5)
- b) Discuss briefly the important aspects of bleeding and segregation of concrete. (5)
- 12.a) Explain the maturity concept and give the factors effecting the maturity concept on curing of concrete. (5)
- b) Explain the mechanical properties of concrete and give the relationships between them. (5)
- 13.a) What are the factors considered in mix design? (5)
- b) Write the steps to design IS, ACI and british methods of mix design. (5)
- 14.a) Write the applications and durability of fly ash concrete. (5)
- b) Differentiate between plasticizers and superplasticizers and how they are mixed in concrete. (5)
- 15.a) Explain the applications of light weight and high density concrete. (5)
- b) Discuss any three types of very high strength concrete. (5)
- 16.a) Explain briefly the quality control aspects of self compacting concrete. (5)
- b) Describe the effects of incorporating fibres in concrete also discuss the uses of glass fibre reinforced concrete. (5)
17. Write the short notes on the following :
  - a) Ferro cement (3)
  - b) Alkali-aggregate reaction (3)
  - c) Long and short term properties of concrete (4)

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**Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A** (2.5 x 10 = 25 Marks)

1. Give the chemical composition of cement.
2. Differentiate between segregation and bleeding.
3. State Abrahm's law.
4. Draw stress-strain curve of concrete.
5. List out any four factors influence the choice of mix design.
6. Why target strength of concrete is important?
7. What is the influence of accelerator on property of concrete?
8. What is meant by ready mixed concrete?
9. List out any four applications of Ferro cement.
10. Define 'Fibre shotcrete'.

**PART – B** (5 x 10 = 50 Marks)

- 11.a) List out different tests on aggregates. Explain in detail any two tests.  
b) Explain in detail the influence of various vibrators on properties of concrete.
- 12.a) Explain the process of determining modulus of elasticity of concrete. Also give the relation between modulus of elasticity and strength of concrete.  
b) Define creep of concrete? And explain in detail factors affecting creep.
13. Design a concrete mix having below particulars using IS : 10262-2009.
  - a) Design strength = 25 MPa
  - b) Max. size of aggregate = 20mm
  - c) Grade of cement = 53 grade
  - d) Degree of workability = 80 mm. slump
  - e) Degree of quality control = Good
  - f) Type of Exposure = Mild
  - g) Sp. Gravity of cement = 3.15
  - h) Sp. Gravity of F.A. = 2.58
  - i) Sp. Gravity of C.A. = 2.6
  - j) Water absorption of CA = 1.00%
  - k) Compressive strength of cement at 7 days = Satisfies the requirement of IS : 269-1989.

Assume any required data suitably.

- 14.a) When plasticizers are required in the preparation of concrete? Also explain in detail the behaviour of plasticizers in concrete?  
b) What is fly ash concrete? Explain its properties in detail.
- 15.a) Explain the preparation of high density concrete. Also explain its applications.  
b) What is the need of fibre reinforced concrete? Explain the mechanism involved in it.
- 16.a) The strength of a sample of fully matured concrete is found to be 53 MPa. (For which A = 42 ; B = 46.5). Find the strength of identical concrete at the age of 7 days when cured at an avg. Temperature during day time at 22°C and night time at 8°C.  
b) What is the influence of temperature on strength of concrete?
17. Write short note on the following :
  - a) Analysis of fresh concrete
  - b) Recycled aggregate concrete