Diploma in Civil Engineering

Term-End Examination

June, 2011

BCE-044 : CONCRETE TECHNOLOGY

Time : 2 hours *Maximum Marks : 70*

Note : *Answer **any five** questions including question number 1 which is **compulsory**.*

1. (a) Answer *any two* of the following in brief (2-3 lines only) : **2x2=4**

    (i) Define segregation and bleeding.

    (ii) Why lightweight concrete is preferable to dense concrete ?

    (iii) What is meant by steam curing ?

   (b) Fill in the blanks (*any Four*) : **4x1½=6**

    (i) Concrete is a mixture of cement, sand, coarse aggregate and _____ in certain proportion.

    (ii) ISI has specified the strength of concrete after _____ days.

    (iii) Modulus of rupture of concrete is a measure of _____.

    (iv) Bulking of sand is maximum if moisture content is about _____.

    (v) According to Indian standards, the pozzolana content in portland pozzolana cement is _____.

(c) select the correct option (*any Four*) :   **4x1=4**

    (i)   Workablility of concrete is directly proportional to (time of transit/ grading of the aggregate/water-cement ratio)

    (ii)   The strength of concrete after one year as compared to 28 days strength is about (10 to 15%/15 to 20%/20 to 25%) more.

    (iii)   The fineness modulus of fine aggregate is in the range of (2.0 to 3.5/3.5 to 5.0/ 5.0 to 7.0)

    (iv)   For walls , columns and vertical faces of all structural members, the frame work is generally removed after (24 to 48 hours/3days/7days/14 days)

    (v)   According to IS : 456, the maximum reinforcement in a column is (2%/ 4%/6%/8%)

2.   (a)   Differentiate between *any two* of the following :   **2x4=8**

    (i)   Flakiness index and Elongation index

    (ii)   Accelerator and Retarder admixtures

    (iii)   weight batching and volume batching

   (b)   Define the following (*any two*) :   **2x3=6**

    (i)   Cement factor

    (ii)   Fineness modulus

    (iii)   Fibre Reinforced Concrete

3. (a) What are the raw materials required for manufacture of cement ? Describe the procedure of determining the compressive strength of cement in laboratory 2+6=8

   (b) Enlist different types of cement . Explain composition and properties of any two in brief. 2+4=6

4. (a) Enlist different mechanical properties of aggregates. Describe in brief the procedure for determining aggregate impact value. 4+4=8

   (b) Enlist the various types of important impurities present in water. Explain the effect of presence of suspended particles in water on the various properties of concrete. 3+3=6

5. (a) Explain bleeding of concrete and give the factor responsible for bleeding of concrete. 6

   (b) Determine the quantities of coarse aggregate and fine aggregate for one bag of cement to prepare a mix of 1 : 1.5 : 3 proportion by volume (in dry state). Consider the bulking of fine aggregate as 20%. 8

6. (a) List the different types of vibrators used for compaction of concrete. Explain screed vibrator in detail. 8

   (b) Enlist different methods of curing. What is steam curing ? 4+2=6

7. Write short notes on *any four* of the following :
    (a) yield of concrete   **4x3½=1**
    (b) Method of concreting
    (c) Cold weather concreting
    (d) Gunite
    (e) Colcrete
    (f) Heavy concrete