

Diploma in Civil Engineering

Term-End Examination

December, 2006

BCE-044 : CONCRETE TECHNOLOGY

Time : 2 hours

Maximum Marks : 70

Note : Answer any **five** questions including question no. 1 which is **compulsory**.

1. (a) Answer any **two** of the following in brief (2 – 3 lines only) 2×2=4
- (i) What do you mean by M-20 grade of concrete ?
 - (ii) What do you understand by “Colcrete” ?
 - (iii) Define Flaky Aggregates.
- (b) Fill in the blanks (any **four**) 4×1 $\frac{1}{2}$ =6
- (i) _____ is the first compound of cement to react with water.
 - (ii) _____ apparatus is used to determine soundness of cement.
 - (iii) Resistance of aggregate to wear is known as _____ of aggregate.

- (iv) The temporary joints provided between subsequent concreting operations are called _____ joints.
- (v) One bag of cement is _____ kg.
- (c) Select the correct option (any **four**) : $4 \times 1 = 4$
- (i) (C_3S/C_2S) provides more resistance to sulphate attacks.
- (ii) “Compaction factor test” is used to determine (workability/compressive strength) of concrete.
- (iii) Heavily reinforced concrete members require (high/low) degree of workability of concrete mix.
- (iv) The process of mixing cement mortar in a machine mixer prior to the mixing of first batch of concrete is called as (charging/buttering) the mixer.
- (v) For determining the standard consistency of cement of Vicat Apparatus (needle of 1 sq. mm/ plunger of 10 mm dia) is used.
2. (a) Differentiate between any **two** of the following : $2 \times 4 = 8$
- (i) Segregation and Bleeding of concrete
- (ii) Hydration of C_3S and C_2S
- (iii) Rodding and Tamping of concrete

- (b) Define the following (any **two**) : $2 \times 3 = 6$
- (i) Workability of concrete
 - (ii) Elongation index of aggregate
 - (iii) Consistency of cement
3. (a) What do you understand by 'batching' ? Give the methods of batching and describe them briefly. $2 + 6 = 8$
- (b) Enlist the different concreting operations in sequence. 6
4. (a) With the help of neat sketch of apparatus, describe the test procedure of any **one** of the following : $4 + 6 = 10$
- (i) Initial setting time of cement by Vicat Apparatus.
 - (ii) Workability of concrete mix by Slump test
- (b) Classify the aggregates on the basis of their shape, size and unit weight. Describe them briefly. 4
5. (a) Explain the precautions to be observed during storing of cement in stacks. 8
- (b) Describe in brief the method of 'Membrane curing' or 'Electrical curing' of concrete. 6
6. (a) What do you understand by pre-cast concrete ? Discuss the advantages and disadvantages of pre-cast concrete. $2 + 8$
- (b) Give the applications of 'Guniting'. 4

7. Write short notes on any **four** of the following : $4 \times 3\frac{1}{2} = 14$

- (a) Sulphate resisting cement and its applications
- (b) Alkali-aggregate reaction
- (c) Gap-graded aggregates
- (d) Ready mix concrete
- (e) Maximum density method of mix design
- (f) Abrams' water cement ratio law