# DIPLOMA IN CIVIL ENGINEERING

## Term-End Examination

## December, 2007

## BCE-044 : CONCRETE TECHNOLOGY

*Time : 2 hours* *Maximum Marks : 70*

***Note :*** *Answer any **five** questions including Q. No. 1 which is **compulsory**.*

**1.** (a) Answer any ***two*** of the following in brief (2 – 3 lines only) : $2 \times 2 = 4$

(i) What is meant by hydration of cement ?

(ii) Define admixtures.

(iii) What is the effect of gypsum on setting time of cement ?

(b) Fill in the blanks (any ***four***) : $4 \times 1\frac{1}{2} = 6$

(i) Vibrators should be penetrated in _____ direction.

(ii) The measurement of quantity of materials for making concrete is called _____ .

(iii) Workability of concrete may be measured by _____ test.

(iv) Buttering the mixer is required before the _____ batch.

(v) One bag of cement contains _____ kg of cement.

(c) Select the correct option (any ***four***) : 4×1=4

(i) Rodding and ramming are the operations related with (curing/finishing/compaction) of concrete.

(ii) The concrete should not be thrown from a height more than (1m/2m/3m).

(iii) For the constant water cement ratio, the use of superplasticizers (increases/decreases/does not affect) the final strength of concrete.

(iv) Workability of concrete mix (increases/ decreases/does not change) with increase in water content.

(v) Bulking of sand is (decrease/increase/no change) in volume.

**2.** (a) Differentiate between any ***two*** of the following : 2×4=8

(i) False set and Flash set of cement

(ii) Flakiness index and Elongation index

(iii) Segregation and Bleeding of concrete

(b) Give the effects of the following on the workability of concrete mix : 3×2=6

(i) Water content

(ii) Grading of aggregate

(iii) Shape of aggregate

**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 physical properties of aggregate. With the help of a neat curve define and discuss the bulking of sand. 2+6=8

(b) What is fineness modulus ? Explain gap-graded aggregate with the curve. 2+4=6

**5.** (a) Explain the importance of conducting tests for setting time of cement. How are these tests conducted ? Explain slump test. 2+6=8

(b) Determine the quantities of coarse aggregate and fine aggregate for one bag of cement to prepare a mix of 1 : 2 : 4 proportion by volume (in dry state). Consider the bulking of fine aggregate as 15%. 6

**6.** (a) Enumerate the various methods of transporting the concrete. Describe transport of concrete by belt conveyors in detail. 2+6=8

(b) List the different types of vibrators used for compaction of concrete. Give the advantages of mechanical compaction over the hand compaction of concrete. 2+4=6

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

(a) Pre-stressed concrete

(b) Ready-mixed concrete

(c) Yield of concrete and cement factor

(d) Trial and error method of mix design

(e) Pre-cast concrete

(f) Objectives of mix design