

**DIPLOMA IN CIVIL ENGINEERING
DCLE(G) / DCLEVI**

Term-End Examination

June, 2016

00330

BCE-044 : CONCRETE TECHNOLOGY

Time : 2 hours

Maximum Marks : 70

Note : Answer *five* questions in all. Questions no. 1 is **compulsory**. All questions carry equal marks.

1. (a) Explain any **two** of the following in brief
(2-3 lines only) : $2 \times 2 = 4$
- (i) Grades of concrete
 - (ii) Calcrete
 - (iii) Ready mix concrete
- (b) Fill in the blanks (any **four**) : $4 \times 1 \frac{1}{2} = 6$
- (i) Workability of concrete is directly proportional to _____.
 - (ii) Strength of concrete _____ with the fineness of cement.
 - (iii) Bulking of sand is maximum if moisture content is about _____.

- (iv) In order to obtain the best workability of concrete, the preferred shape of aggregate is _____.
- (v) Air entrainment in the concrete increases _____.
- (c) Select the correct option given in the brackets for the following : $4 \times 1 = 4$
- (i) Increase in the moisture content in concrete [reduces/increases/does not change] the strength.
- (ii) The most commonly used admixture which prolongs the setting and hardening time is [gypsum/calcium chloride/sodium silicate].
- (iii) In case of hand mixing of concrete, the extra cement to be added is [5%/10%/15%].
- (iv) Ratio of compressive strength to tensile strength of concrete [increases with age/ decreases with age/remains constant].
- (v) For a constant water-cement ratio, decrease in aggregate - cement ratio causes [increase/decrease/no change] in workability.

2. (a) Define characteristic strength of concrete. Which grades of concrete are suitable for normal RCC ? Which are the concrete grades generally used for lean concrete ?

7

- (b) What is the function of ribs present on steel ? Enlist the properties of concrete in hardened stage. What are the factors affecting creep of concrete ? $2+3+2=7$
3. (a) State the important raw materials used in the manufacture of cement. Draw a flow-chart to show the important steps in the manufacture of cement. $2+5=7$
- (b) What are the physical properties of cement ? Explain the requirement of water for heat of hydration in mass concrete. $3+4=7$
4. (a) Explain the procedure for determining flakiness and elongation index. 7
- (b) Explain with the help of a neat curve the bulking of sand and its importance. 7
5. (a) Describe the procedure of determining the initial and final setting time of cement in the laboratory. 7
- (b) Explain the importance of performing sieve analysis. Define the importance of grading curve. 7

6. (a) Explain the effect of age and temperature on the strength of concrete. Explain the hydration of cement compound. 7
- (b) Explain the workability of concrete mix and its importance. Enlist the various factors influencing the workability of concrete mix. 7
7. Write short notes on any *four* of the following : $4 \times 3 \frac{1}{2} = 14$
- (a) Weigh and volume batching
- (b) Construction, expansion and contraction joint
- (c) Types of vibrator and their use
- (d) Advantage of steel formwork
- (e) Pre-stressed concrete
- (f) Underwater concreting
-