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BCE-044

DIPLOMA IN CIVIL ENGINEERING DCLE(G) / DCLEVI

00595 **Term-End Examination**

December, 2014

BCE-044 : CONCRETE TECHNOLOGY

Time : 2 hours *Maximum Marks : 70*

Note : *Answer **five** questions in all. Question no. **1** is **compulsory**.*

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

(i) Write a condition requiring the use of expanding cement.

(ii) Define unsound aggregates.

(iii) Define "Buttering of Concrete Mixer".

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

(i) Type of cement used for underwater concreting is _____ .

(ii) Reaction of cement with water is called as _____ of cement.

(iii) "Compaction Factor Test" is used to measure _____ of concrete.

(iv) Full form of RMC is _____.

(v) Standard consistency of cement is determined by using _____ apparatus.

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

(i) ($C_2S/C_3S/C_3A$) generates less heat of hydration.

(ii) 0·82 compaction factor is related to (very low/low/medium) workability of concrete.

(iii) Under normal circumstances (i.e. at 20°C temperature with ordinary cement) the stripping time for vertical sides of column is (2/7/21) days.

(iv) Concreting done below (0°C/5°C/20°C) temperature is called as cold weather concreting.

(v) (Flaky/Elongated/Angular) aggregates are most preferred for good quality concrete.

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

(i) Light weight and Heavy weight aggregates

(ii) Floating and Troweling of concrete surface

(iii) Gap-graded and Well-graded aggregates

(b) Define any ***two*** of the following : *2×3=6*

(i) Final setting time of cement

(ii) Workability of concrete mix

(iii) Gunite

3. (a) Differentiate between hydration processes of C_3A and C_3S. 7

(b) Discuss the bleeding phenomenon of concrete. Explain why some bleeding may be desired in the case of pumped concrete. 7

4. (a) Determine quantities (in terms of volume) of coarse aggregate and fine aggregate required for one bag of cement to prepare a mix of 1 : 1·5 : 3 proportion by volume (in SSD condition). Consider the bulking of fine aggregate as 12%. 7

(b) Differentiate between flaky and elongated aggregates. Discuss why both of these aggregates, in substantial quantities, may not be desired. 7

5. (a) Discuss special precautions needed to be taken for underwater concreting. Describe the Tremie method of underwater concreting. 7

(b) Define 'Pre-cast concrete'. Discuss the advantages and disadvantages of using it. 7

6. (a) Describe the importance and objective of curing of concrete. Explain the salient features of membrane curing and steam curing. 7

(b) Describe the problems encountered and precautions to be taken during hot-weather concreting. 7

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

(a) Expansion joint in concrete construction

(b) Colcrete

(c) Aggregate crushing value

(d) Shrinkage of concrete

(e) Precautions during placing concrete

(f) Heavy concrete and its application