53 (CE 504) CRTC

2017

CONCRETE TECHNOLOGY

Paper : CE 504

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. *(a)* What is portland cement ? Explain the manufacturing process of portland cement. 5+5=10

   (b) Explain hydration of cement. 5

   (c) Define heat of hydration. 5

2. Determine the proportion of the ingredient of concrete using IS code from following data — 20

   (i) Characterstic compressive strength required in the field at 28 days = $30 N/mm^2$

(ii) Maximum size of aggregate = 40*mm*

(iii) Slump required = 50*mm*

(iv) Type of aggregate = subangular

(v) Chemical admixture = super plasticizer

(vi) Method of concrete placing = pumping

(vii) Sp. gravity of admixture = 1·144

(viii) Sp. gravity of cement, FA and CA are 3·15, 2·74 and 2·75 respectively.

(ix) Sand conforming to zone III.

3. (a) Describe standard consistency test procedure. 8

(b) How soundness of cement is determined ? 7

(c) Explain Abram's law. 5

4. (a) Define durability of concrete. What are the requirements for preparing durable concrete ? What are the factors affect durability on concrete ? 2+3+5=10

(b) Differentiate nominal mix and standard mix. 5

(c) What do you mean by uniform grading, gap grading and continuous grading ? 5

5. (a) Explain abrasion test of aggregate. 5

(b) What do you mean by bulking of sand ? 5

(c) What do you mean by workability ? What are the factors affecting workability ? How workability is determined ? 2+6+2=10

6. (a) Write short notes on : ***(any two)*** 5×2=10

(i) Mass concrete

(ii) Flow test

(iii) Aggregate impact test.

(b) What do you mean by curing ? What are the method for curing ? 2+4=6

(c) Determine the flakiness index and elongation index of coarse aggregate for the following data — 4

(i) Weight passing through 6·3*mm* IS sieve = 550*gm*

(ii) Weight passing through thickness gauge = 105*gm*

(iii) Weight retained on length gauge = 135*gm*

(iv) Total weight of coarse aggregate = 3*kg*.
