53 (CE 504) CNTC

2018

CONCRETE TECHNOLOGY

Full Marks : 100

Time : Three hours

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

Answer ***any five*** *questions.*

1. Determine the proportion of the ingredient of concrete using IS code method from the following data. Also find the actual quantity required for 1 bag of cement for the surface water and water absorption condition of aggregate — 20

   (i) Characteristic compressive strength required in the field at 28 days = $40 N/mm^2$.

   (ii) Maximum size of aggregate = 20*mm*.

   (iii) Type of aggregate = Angular.

   (iv) Slumb required = 100*mm*.

   (v) Exposure condition = Severe.

Contd.

(vi) Chemical admixture = Super plasticizer.

(vii) Mineral admixture = fly ash.

(viii) Method of concrete placing = pumping.

(ix) Specific gravity of cement, FA, CA and fly ash are 3·15, 2·74, 2·74 and 2·2 respectively.

(x) Water absorption of FA and CA are 1·0 and 0·5 per cent respectively.

(xi) Free surface water content of FA and CA are 0·00 and 0·00 respectively.

(xii) Sand conforming to zone I.

(xiii) Specific gravity of admixture = 1·144.

2. (a) Define Abram's law and state its limitations. What is creep in concrete? 10

(b) What do you mean by non destructive test of concrete? Explain rebound hammer test. 10

3. (a) What is sulphate attack in concrete? Give some methods of controlling sulphate attack. 10

(b) What are the main components of portland cement? Explain the basic properties of these components. 10

4. *(a)* Define workability. Explain slump test for determining workability. 10

(b) Describe about light weight concrete. What are the advantages of light weight concrete ? 5+5=10

5. *(a)* Explain the consistency test of cement. 10

(b) Mention different methods of curing of concrete. 5

(c) Briefly focus on different internal and external factors that affect durability. 5

6. Write short notes on : ***(Any four)*** 5×4=20

(a) Ready mix concrete

(b) Ferro cement and its application

(c) Aggregate impact test

(d) Extra rapid hardening cement

(e) Accelerator and retarders.
