

Total number of printed pages—4

53 (CE 504) CNTC

2021

## CONCRETE TECHNOLOGY

Paper : CE 504

Full Marks : 100

Time : Three hours

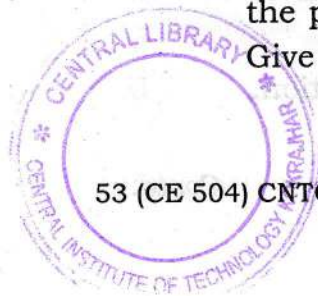
**The figures in the margin indicate full marks for the questions.**

*Answer any five questions.*

1. (a) Explain the basic properties of cement compounds formed in high clinkering temperature. 10
- (b) Enumerate various tests conducted on cement to access its characteristics. 5
- (c) Explain hydration of cement. 5
2. (a) Explain the heat of hydration. 5

Contd.

- (b) What are Bogue's compounds and when are these formed? 4+1=5
- (c) Describe about the different types of cements. 10
3. (a) What are the different types of aggregates? 5
- (b) Describe about the different characteristics of aggregates. 10
- (c) What do you mean by bulking of sand? 5
4. (a) Define durability of concrete. What are the requirements for preparing durable concrete? What are the factors affecting durability of concrete? 2+3+5=10
- (b) Differentiate nominal mix and design mix. 5
- (c) How can the use of admixtures improve the properties of concrete, in general? Give some examples of admixtures. 4+1=5



5. Determine the proportion of the ingredients of concrete using IS Code from the following data : 20
- (i) Characteristic compressive strength required in the field at 28 days =  $30 \text{ N/mm}^2$ .
  - (ii) Maximum size of aggregate =  $40 \text{ mm}$
  - (iii) Slump required =  $50 \text{ mm}$
  - (iv) Type of aggregate = subangular
  - (v) Chemical admixture = superplasticizer
  - (vi) Method of concrete placing = pumping
  - (vii) Sp. gravity of admixture = 1.44
  - (viii) Sp. gravity of Cement, FA and CA are 3.15, 2.74 and 2.75 respectively.
  - (ix) Sand conforming to zone III.
6. Write short notes on : **(any four)**  $5 \times 4 = 20$
- (a) Slump test
  - (b) Aggregate impact test



- (c) Extra rapid hardening cement
- (d) Accelerators and retarders
- (e) Bleeding and segregation.

