

Roll No. ....

23725

M. Tech. 1st Semester (Civil Engg.  
Computer Aided Structural Engg.)  
Examination – February, 2022  
ADVANCED CONCRETE TECHNOLOGY

Paper : 21MTCASE21G5

Time : Three Hours ]

[ Maximum Marks : 100

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

*Note :* Attempt five questions in all. Assume missing data, if any, suitably. All questions carry equal marks.

1. (a) Define aggregate and grading of aggregates. Describe the classification of aggregates on different basis. 10
- (b) What do you mean by grade of cement ? Describe the different types of cement in detail. 10
2. (a) What do you mean by heat of hydration ? Describe the structure of hydrated cement. 10

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- (b) What are the factors affecting the strength of concrete? Describe the properties of light weight and high-density concrete. 10
3. (a) What do you mean by hardened concrete? Describe the mechanical test of hardened concrete. 10
- (b) What do you understand by carbonation of concrete and cracking of concrete? How does it affect durability? Describe briefly. 10
4. (a) Design the concrete mix for grade M20 with suitable conditions. Find the quantities of constituents of the mix for a bag of cement. 10
- (b) Define concrete mix design. Describe the procedure in adopting ACI method of concrete mix design. 10
5. (a) What do you mean by high strength and high-performance concrete? Describe the advantages of using high-strength concrete. 10
- (b) What are the non-destructive techniques used for testing strength of concrete? Describe each in detail. 10
6. (a) What are the various quality control tests done to ensure good performance of polymer concrete? 10

- (b) What are the basic properties of fiber-reinforced concrete which can be advantageously made use of in the design of structural elements? 10
7. (a) What is batching of concrete? Describe the advantages of using ready mixed concrete instead of site mixed concrete? 10
- (b) Define hot weather and cold weather concreting. Describe the methods used for consolidating concrete? 10
8. Describe the following: 20
- (i) Elasticity of concrete
  - (ii) Shrinkage and creep of concrete
  - (iii) Tests for fresh concrete
  - (iv) Design aspects of aerated concrete
  - (v) Chemical attack of concrete
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