



# 17504

15162

3 Hours / 100 Marks

Seat No.

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- Instructions :** (1) *All questions are compulsory.*  
(2) *Answer each next main question on a new page.*  
(3) *Illustrate your answers with neat sketches wherever necessary.*  
(4) *Figures to the right indicate full marks.*  
(5) *Assume suitable data, if necessary.*  
(6) *Use of Non-programmable Electronic Pocket Calculator is permissible.*  
(7) *Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.*

Marks

1. A) Attempt **any three** of the following. (3×4=12)
- a) Enlist any four physical properties of OPC. Explain how fineness of cement is determined by method of sieving.
  - b) State three different grades of cement and where it is used.
  - c) Compare the properties of rapid hardening cement and low heat cement.
  - d) Explain the step by step procedure of standard consistency test on cement.
- B) Attempt **any one** of the following. (6×1=6)
- a) Explain the phenomenon of bulking of sand. State the effects of bulking of sand on concrete.
  - b) State any four properties of coarse aggregate and explain the method to determine abrasion value of coarse aggregate.
2. Attempt **any four** of the following. (4×4=16)
- a) State the necessity of supervision for concreting operation (any four).
  - b) Explain the 3 grades of concrete as per the provisions of IS 456-2000.
  - c) State any four factors affecting the workability of concrete.
  - d) State any four precautions to be taken to avoid segregation.
  - e) State any four objectives of concrete mix design.
  - f) State the importance of NDT of concrete and explain rebound hammer test.
3. Attempt **any four** of the following : (4×4=16)
- a) Explain flakiness index and elongation index.
  - b) What is meant by grading of aggregates ? Explain :
    - i) well graded
    - ii) gap graded and
    - iii) poor graded aggregates.

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- c) Crushing value test was conducted on coarse aggregate in the laboratory and the observations are recorded as given below. Find average crushing value of coarse aggregate and state its suitability.

SI. No.	Sample No.	I	II	III
1.	Weight of oven dried sample ( $w_1$ ) in gms	3150	3085	3212
2.	Wt. of fraction passing 2.36 mm ( $w_2$ ) sieve in gms	570	582	602

- d) Define Bulk density of aggregates. State three factors that affect the bulk density.  
e) Explain the procedure to determine impact value of coarse aggregate.

4. A) Attempt **any three** of the following (3×4=12)

- What is meant by batching ? Explain the two types of batching.
- State any four advantages of compaction by vibrators.
- State any four differences between steel formwork and timber formwork.
- Explain the two different methods of water proofing.

B) Attempt **any one** of the following. (6×1=6)

- What are the precautions to be taken during transportation of concrete ?
- What are the precautions to be taken while placing the concrete in formwork ?

5. Attempt **any four** of the following. (4×4=16)

- Define admixtures. State any four types of admixtures and their use.
- State the advantages of ready mix concrete.
- State the effects of hot weather on concrete and explain the precautions to be taken during hot weather concreting.
- State any four properties of fibre reinforced concrete.
- Compare accelerating admixtures with retarding admixtures.
- List any four types of special concretes. Explain the properties and limitations of light weight concrete.

6. Attempt **any four** of the following. (4×4=16)

- What are the precautions to be taken during mixing of concrete ?
- Explain the method of joining old and new concrete.
- What are super plasticizers ? State the properties and uses of super plasticizers.
- State the properties of High performance concrete and its uses.
- State any four factors affecting durability and impermeability of concrete.
- Define mix design and enlist the different methods of mix design of concrete.