

22305

11819

3 Hours / 70 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.
 - (8) Preferably, write the answers in sequential order.

Marks

1. **Attempt any FIVE of the following:** **10**
- a) List four physical properties of OPC.
 - b) Define bulking of sand.
 - c) State Duff Abraham's water cement ratio law.
 - d) Name four methods of concrete mix design.
 - e) In sequence, write concreting operations.
 - f) State two purposes of using accelerating admixtures in the concrete.
 - g) State two uses of low heat cement.

P.T.O.

2. Attempt any THREE of the following: 12

- a) Explain the method to determine initial and final setting time of cement.
- b) Classify the aggregate based on its size and shape.
- c) Calculate the average crushing value of aggregate using following data and write its suitability.

Sr. No.	Description	Sample No. →	A	B	C
1	Weight of oven dried sample		3119	3246	3184
2	Weight of fraction passing 2.36mm } I.S. Sieve		575	581	598

- d) A sand sample has a fineness modulus of 1.95. Whether this sand can be used for concreting? Explain the procedure to bring the fineness modulus in required permissible limits. State its importance.

3. Attempt any THREE of the following: 12

- a) Suggest the compaction factor for following degree of workability.
 - (i) Medium
 - (ii) High
 - (iii) Very low
 - (iv) Low
- b) Illustrate the effect of properties of coarse aggregates on compressive strength of concrete.
- c) Explain the procedure for measurement of workability of fresh concrete using slump cone test.
- d) Explain the necessity of supervision for concreting operations (any four)

- 4. Attempt any THREE of the following:** **12**
- a) Explain the importance of water / cement ratio in the concrete mix.
 - b) Write four objectives of concrete mix design.
 - c) Describe four characteristics of ready mix concrete.
 - d) Explain four effects of hot weather on concrete.
 - e) Write two advantages and two disadvantages of vacuum de-watered concrete floor.
- 5. Attempt any TWO of the following:** **12**
- a) Explain the laboratory procedure to determine the compressive strength of concrete cubes as per IS-516-1959 with reference to following points:
 - (i) preparation of test specimen
 - (ii) Procedure of testing
 - (iii) Interpretation of results.
 - b) Explain the rebound hammer test procedure and show the relationship between compressive strength and rebound number with hammer horizontal and vertical on a dry and wet surface of concrete.
 - c) Explain the ultrasonic pulse velocity test and techniques of measuring pulse velocity through concrete.
- 6. Attempt any TWO of the following:** **12**
- a) Write four requirements of good formwork and draw a sketch showing cross section of formwork for a L-shaped column.
 - b) Suggest one type of materials for water proofing for the following situations:
 - (i) Rising dampness in building
 - (ii) Leakages in dam
 - (iii) Concrete continuously in wet or damp condition.
 - (iv) Leakages in lavatory, bathroom and kitchen floor
 - (v) Cracks on plastered surface
 - (vi) Cracks on roof surface
 - c) Suggest the type of joints in concrete when it is likely to increase in volume due to temperature change. Explain it and draw its neat sketch.
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