

17504

14115

3 Hours / 100 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) Attempt any **THREE** of the following: **12**
- (i) Explain the process of hydration of cement.
- (ii) What are the special properties of low heat cement and white cement? State where they are used.
- (iii) Explain the procedure to determine standard consistency of cement.
- (iv) What is the meaning of 33 grade 43 grade and 53 grade cement? State where they are used.
- b) Attempt any **ONE** of the following: **6**
- (i) Explain the stepwise procedure to determine bulking of sand and draw nature of graph showing maximum percentage bulking.
- (ii) State procedure for application of load on coarse aggregate in crushing and impact test.

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- 2. Attempt any FOUR of the following:** **16**
- a) State the different grades of concrete as per provisions of IS 456-2000 and explain their properties.
 - b) State Duff Abraham W/C law. State the significance of W/C ratio with regards to strength of concrete with the help of graph.
 - c) Define workability of concrete. State any three factors affecting workability of concrete.
 - d) Explain stepwise procedure of compaction factor test.
 - e) Write objectives of mix design of concrete. List any three methods of concrete mix design.
 - f) Explain how ultrasonic pulse velocity test is conducted and write specification to decide quality of concrete.
- 3. Attempt any FOUR of the following:** **16**
- a) Classify coarse aggregate based on size and shape and explain how it affects strength of concrete.
 - b) Explain procedure to find specific gravity of fine aggregate is determined?
 - c) Write stepwise procedure to find fineness modulus of coarse aggregate.
 - d) Explain Los Angeles method of abrasion value determination for coarse aggregate and also write IS requirements for this value.
 - e) State the working principle of rebound hammer and write any two factors affecting rebound index.

4. a) **Attempt any THREE of the following:** **12**
- (i) Enlist the various concrete operations in sequence and explain any one in detail.
 - (ii) State what is batching. What are the two types of batching?
 - (iii) Draw a figure of form work used for column. Also state stripping time of form work for beam and slab.
 - (iv) What are the precautions to be taken while transportation of concrete?
- b) **Attempt any ONE of the following:** **6**
- (i) Explain any three methods of curing of concrete.
 - (ii) State any two methods of water proofing and explain any one method.
5. **Attempt any FOUR of the following:** **16**
- a) What is an admixture? State any four admixtures used in concrete.
 - b) State any four properties of high performance concrete.
 - c) What are the precautions to be taken while concreting under extreme cold conditions.
 - d) State difference between retarding admixtures and accelerating admixtures.
 - e) Compare air entraining admixtures with super plasticisers.
 - f) What is light weight concrete? Where it is used?

6. Attempt any FOUR of the following:**16**

- a) State any four requirements for good form work.
 - b) Explain any one method of joining old and new concrete.
 - c) Explain the significance of water reducing admixture in concrete with respect to properties of concrete.
 - d) What is ready mix concrete? State any four advantages of RMC.
 - e) What is segregation and bleeding? Suggest any two ways by which segregation and bleeding can be avoided.
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