

# 22305

**23124**

**3 Hours / 70 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. Attempt any FIVE of the following :** **10**
- State the meaning of 43 and 53 grade of cement.
  - Explain the phenomenon of bulking of sand.
  - State Duff Abraham's water cement ratio law.
  - State four objectives of concrete Mix Design.
  - State the stripping time of form work as per IS-456-2000
    - Beam
    - Column
  - State any two advantages and disadvantages of vacuum de-watering of concrete floor.
  - State the importance of standard consistency test of cement.

P.T.O.

2. Attempt any THREE of the following :

12

- a) Explain the procedure to determine fineness of cement by dry sieving method. State its IS requirement.
- b) Explain the procedure to determine the crushing value of aggregate.
- c) Calculate fineness modulus for the given data of fine aggregate. Total weight of F.A. = 2000 gm.

Sieve size (mm)	4.75 mm	2.36 mm	1.18 mm	600 $\mu$	300 $\mu$	150 $\mu$	Pan
Weight Retained (gm)	186	241	376	440	471	272	14

- d) Explain procedure to find specific gravity of the fine aggregate in laboratory.

3. Attempt any THREE of the following :

12

- a) Enlist the various concrete operations in sequence and explain any one in detail.
- b) Explain the procedure for determining the workability of fresh concrete using a slump cone.
- c) Explain four factors affecting workability of concrete.
- d) Define :
  - i) Workability of concrete
  - ii) Durability of concrete
  - iii) Bleeding of concrete
  - iv) Segregation of concrete

- 4. Attempt any THREE of the following :** **12**
- a) Explain any four major steps to be taken to achieve durability of concrete on site.
  - b) Draw a neat and labeled sketch of rebound hammer and write two limitations of Rebound Hammer Test.
  - c) Enlist any four precautions to be taken during cold weather concreting.
  - d) State four point of differences between reinforced concrete and fibre reinforced concrete.
  - e) Differentiate between retarding admixture and accelerating admixture on following points.
    - i) Hydration process
    - ii) Setting time
    - iii) Weather condition
    - iv) Use
- 5. Attempt any TWO of the following :** **12**
- a) Explain the step by step procedure of concrete mix design by IS method as per IS-10262.
  - b) Explain the ultrasonic pulse velocity test and techniques of measuring pulse velocity through concrete.
  - c) State one suitability each of any six non-destructive tests.

**6. Attempt any TWO of the following :****12**

- a) Enlist the types of joints provided in concrete with neat sketches. Also state their necessity.
  - b) State any four requirements of good form work and draw labeled sketch of form work for -
    - i) Slab
    - ii) Column
  - c) Suggest methods of waterproofing for the following situations along with justification.
    - i) Waterproofing for slab
    - ii) Waterproofing for bathroom
    - iii) Waterproofing for basement.
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