

22305

21222

3 Hours / 70 Marks

Seat No.

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15 minutes extra for each hour

- 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. Attempt any FIVE of the following: **10****
- a) List four Bogue's compound.
 - b) State classification of aggregate with respect to shape and size.
 - c) Define Duff Abraham's w/c ratio law.
 - d) Name four methods of concrete mix design.
 - e) List four methods of water proofing.
 - f) Define admixture used in concrete.
 - g) Explain water requirement for hydration of cement.

P.T.O.

2. Attempt any THREE of the following:**12**

- a) List four physical properties of OPC. Explain how fineness of cement is determined by method of sieving.
- b) List eight requirements of aggregate in the formation of good concrete.
- c) Impact value test was conducted on coarse aggregate in the laboratory and the observations are recorded as given below. Find average impact value of coarse aggregate and state its suitability.

Sr. No.	Sample / Item	I	II
1.	Weight of oven dried sample (W_1) gm	645	636
2.	Weight of fraction passing through 2.36 mm IS sieve (W_2) gm	122	134
3	Weight of fraction retained 2.36 mm IS sieve (W_3) gm	523	502

- d) Explain the criteria to classify coarse aggregate as flaky and which properties of concrete are affected by flaky aggregate.

3. Attempt any THREE of the following:**12**

- a) Suggest degree of workability in terms of slump for the following.
 - i) Road pavement
 - ii) Mass concrete foundation
 - iii) Heavily reinforced concrete
 - iv) Tremie concrete
- b) Explain stepwise procedure of compaction factor test.
- c) Explain necessity of supervision for concreting operations.
- d) Explain bleeding. Suggest two ways by which bleeding can be avoided.

- 4. Attempt any THREE of the following:** **12**
- a) Define workability. List three factors affecting workability.
 - b) Write four objectives of concrete mix design.
 - c) Write two effects and two precautions in hot weather concreting.
 - d) Write four properties of light weight concrete.
 - e) Explain Ready Mix Concrete. Write two uses of RMC.
- 5. Attempt any TWO of the following:** **12**
- a) Explain ultrasonic pulse velocity test with appropriate sketches.
 - b) State step by step procedure for determination of compressive strength of concrete cube.
 - c) Explain in detail IS method of concrete mix design.
- 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 slab.
 - b) Write three methods of curing and also explain the necessity of curing.
 - c) i) Suggest the relevant method of transportation of concrete used for construction in following situation.
 - (1) Concreting in hilly areas
 - (2) Concreting of high rise building
 - (3) Concreting under water
 - ii) Suggest the relevant type of vibrator to be used for following constructions.
 - (1) Road pavement slab
 - (2) Prefabricated RCC member
 - (3) Precast columns
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