22305

24225

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answer with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) 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) Enlist four physical properties of OPC.

b) Enlist four Bouge's compounds of cement with formula.

c) Define fineness modulus (f.m.) of aggregate.

d) State Duff Abraham's law of water cement ratio.

e) State any four objectives of concrete mix design.

f) List four materials used for filling the joints in concrete.

g) State two purposes of using retarding admixtures in the concrete.

Marks

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

a) State the precautions to be taken while storing the cement on site.

b) Calculate the fineness modulus of a given sample using following data:

Sieve size in	4.75 mm	2.36 mm	1.18 mm	600 μ	300 μ	150 μ	Below 150 μ
wt. retained in (gm.)	22	115	225	240	280	105	13

Total weight of sample is 1000 gm.

c) Explain the experimental procedure to find specific gravity of the fine aggregate in Laboratory.

d) Illustrate the procedure to determine crushing value of coarse aggregate.

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

a) State any four factors affecting the workability of concrete.

b) State the minimum grade of concrete for different exposure conditions.

c) Enlist the methods of concrete mix design and state the necessity of concrete mix design.

d) Explain the experimental procedure of determination of workability of concrete by slump cone test.

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

a) Define segregation and bleeding. Suggest any two ways by which segregation and bleeding can be avoided.

b) Write the significance of w/c ratio and it's effect on hydration of cement.

c) Write the precautions to be taken while mixing the concrete on site.

d) Draw a neat and labelled sketch of formwork for a Beam.

Marks

e) Differentiate between retarding and accelerating admixtures with following points:

i) Hydration process

ii) Setting time

iii) Weather condition

iv) Use.

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 effect of shape and size of aggregate on durability, workability and strength of concrete.

c) State the importance of NDT enlist the different methods of NDT.

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

a) Explain the ultrasonic pulse velocity test on concrete in details.

b) Suggest the materials for water proofing for the following situations.

i) Leakages in Roof slab

ii) Leakages in swimming pool.

iii) Vertical and Horizontal cracks in elevated water tank.

iv) Cracks on plastered surface.

v) Heavy leakages in canal.

vi) Leakages in Dam.

c) State the precautions to be taken in Hot and Cold weathering concrete.