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- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Diagrams and Chemical equation should be given wherever necessary.
 5. Illustrate your answers wherever necessary with the help of neat sketches.

- 1.** a) What are different test of cement? Explain any one in detail. **6**
b) Write various Mechanical properties of aggregates and its limitation. **6**
c) Explain in brief water requirement for hydration of cement in brief. **4**

OR

- 2.** a) Write the Bogue's compound with their chemical & abbreviated formula. **6**
b) Explain in brief permeability test for measuring specific surface of cement. **6**
c) Explain the FM of aggregates and its significance. **4**
3. a) What is mean by workability? Explain different methods to measure workability. **8**
b) Explain the Abram's water cement ratio and also discuss significance of water cement ratio. **8**

OR

- 4.** a) List the major physical properties of aggregates as specified in IS:383. **8**
b) What is mean by curing of cement? Explain different methods of curing. **8**
5. a) Differentiate between cube strength and cylindrical strength of concrete. **6**
b) Explain in brief effect of temperature on curing and strength gain. **6**
c) What is aspect ratio and discuss its importance. **4**

OR

- 6.** a) Explain the air entraining agent and its effect on the properties of concrete. **6**
b) Enlist the various NDT test. Also explain any one in detail. **6**
c) Explain factors affecting measurement of pulse velocity. **4**

7. a) What are the different factors contributing cracks in concrete. 6
 b) What is sulphate attack in concrete? State methods of controlling sulphate attack. 6
 c) State different factors contributing cracks in concrete. 4

OR

8. a) Enlist and explain different types of admixtures. 8
 b) Write a note on **any two**. 8
 i) Calcium chloride in concrete.
 ii) Super Plasticizer.
 9. a) What are the factors affecting proportioning of concrete mixes. 8
 b) Explain in brief stepwise I.S. Code methods of mix design. 8

OR

10. Design a concrete mix design of M-25 grade Take standard deviation 5MPa. The specific gravity of coarse aggregate and fine aggregate are 2.8 and 2.5 respectively. 16
 The bulk density of coarse aggregate is 1650 kg / cum.
 Assume any data whenever required.
 Specific gravity of cement = 3.10
 Water absorption of CA = 0.80% & FA = 1.10%
