

(3 Hours)

[ Total Marks : 80]

- N.B. :** (1) Q. 1 is **COMPULSORY**.  
(2) Attempt any **THREE** from the remaining.  
(3) Each full question carries **EQUAL** marks.  
(4) **ASSUME** any suitable data, if needed.

1. (a) Four non-overlapping consecutive cube test results in (N/mm<sup>2</sup>) at 28 days testing are: 37.80, 42.50, 39.80 & 40.70. Determine for what characteristic compressive strength ( $f_{ck}$ ), the results can be accepted. 4  
(b) What is slump of concrete? How is it measured? 4  
(c) Write a note on bleeding of concrete. 4  
(d) What are the causes of distress in concrete structures? 4  
(e) Explain underwater concreting.

2. Write notes on the following. 20  
(a) Segregation of concrete (b) Curing of Concrete  
(c) Ready Mixed Concrete (d) Superplasticizers

3. (a) Explain the Self Compacting Concrete. 7  
(b) Discuss the various mineral admixtures. 7  
(c) Write a note on Non Destructive Testing by using Ultrasonic Pulse Velocity method. If a concrete gives pulse velocity of 2 km/second, give your comments on the quality of concrete with reference to Indian Standard specifications. 6

4. Write notes on the following. 20  
(a) High Performance Concrete (b) High Strength Concrete  
(c) Rapid Hardening Cement (d) Creep of concrete

5. Write notes on the following. 20  
(a) Hot Weather Concreting  
(b) Roller Compacted Concrete  
(c) Fibre Reinforced Concrete  
(d) Effect of permeability on concrete durability

[Turn Over]

6. (a) The following table gives compressive strengths (MPa) of 20 numbers of concrete cubes tested in a laboratory. Calculate: Average strength, standard deviation and coefficient of variation. 5

Sample No.	Comp. Strength	Sample No.	Comp. Strength	Sample No.	Comp. Strength	Sample No.	Comp. Strength
1	32	6	31	11	33	16	29
2	28	7	27	12	31	17	30
3	30	8	30	13	30	18	31
4	28	9	32	14	28	19	30
5	29	10	28	15	28	20	28

- (b) Discuss the factors affecting the concrete workability.  
(c) Explain the Split Tensile Test.  
(d) Discuss the Alkali Silica Reaction.

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