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B.Tech.
(SEM V) THEORY EXAMINATION 2022-23
CONCRETE TECHNOLOGY

Time: 3 Hours**Total Marks: 100****Note:** Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt all questions in brief. 2x10 = 20

- (a) What is the role of gypsum while manufacturing the cement?
- (b) Write about OPC and its different grades.
- (c) Explain the use of workability agents?
- (d) Explain the effect of Air entraining admixture?
- (e) Why do you prefer weigh batching to volume batching?
- (f) What is the use of needle vibrator?
- (g) What is coefficient of variation?
- (h) State the objectives of Mix Design.
- (i) Enlist the various tests for determining the workability of Self compacting Concrete.
- (j) What is the difference between High Strength Concrete & High-Performance Concrete?

SECTION B

2. Attempt any three of the following: 10x3 = 30

- (a) Explain hydration process of cement in detail.
- (b) What is bonding admixture and how does it help in retrofitting of structure?
- (c) Explain in detail about the factors which effect the workability of concrete?
- (d) Explain standard deviation, coefficient of variation and Mean Strength?
- (e) What is Fiber reinforced Concrete? Discuss its properties and uses.

SECTION C

3. Attempt any one part of the following: 10x1 = 10

- (a) Illustrate important characteristics of aggregates.
- (b) Discuss the suitability of any Three types of cement?

4. Attempt any one part of the following: 10 x1 = 10

- (a) Explain role of “Accelerating and Reducing admixture”?
- (b) How does the quality of concrete get improved if Pozzolana is added to concrete?

5. Attempt any *one* part of the following: 10x1 = 10

- (a) Explain the different methods to transport the concrete from place of mixing to place of deposition?
- (b) Explain the objective of compaction of concrete? Discuss the various methods of compaction used for making good quality concrete?

6. Attempt any *one* part of the following: 10x1 = 10

- (a) Proportion a concrete mix for M30 grade concrete by IS method. Given data: maximum nominal size of aggregate: 20mm; minimum cement content: 340kg/cum; maximum w/c ratio: 0.45; workability: 75mm slump; exposure: severe; concreting type: Manual; quality at site: good; aggregate type: angular; Zone of Fine Aggregate II; sp. gr of cement – 3.15, Coarse aggregate – 2.68, Fine aggregate - 2.62 ; Design using IS 10262 – 2019.
- (b) Design a concrete mix for construction of an elevated water tank, specified design strength is 30 mpa @ 28 days. The specific gravity of F.A. and C.A. are 2.65 & 2.7 respectively. Zone of fine aggregate is III. OPC (43 Grade) will be used. A slump of 100mm is necessary. C.A. is found to be absorptive to extent of 1% and free surface moisture of sand is 2% assume any other data. Exposure condition is moderate (IS 10262-2019)

7. Attempt any *one* part of the following: 10x1 = 10

- (a) Write a note on the use of ready-mix concrete discussing its limitations and future use.
- (b) What is Self-Compacting Concrete? Discuss its properties and uses.