

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- May-2018

B.Tech IV Semester

COURSE CODE: Concrete Technology

MAX. MARKS: 35

COURSE NAME: 11B11CE411

COURSE CREDITS: 4

MAX. TIME: Two Hours

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*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. IS: 10262:1982, IS:383:1970 and IS 456:2000 are permitted.*

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1. What is alkali aggregate reaction? List some of the rock types that are vulnerable to attack by alkaline solutions. Discuss the effect of aggregate size on the phenomenon.
2. With coastal and offshore structures directly exposed to sea water, why does the most of the deterioration occur in the tidal zone? From the surface to the interior of concrete, what is the typical pattern of chemical attack in sea structures?
3. How does aggregate size influence the coefficient of permeability of concrete? List other factors that determine the permeability of concrete in a structure.
4. At a given water to cement ratio, either a change in the cement content or aggregate grading can be made to increase the consistency of a concrete mixture. Which one of the two options would you recommend? Why it is not desirable to produce concrete mixtures of a higher consistency than necessary?
5. Can we use recycled water from industrial operations as mixing water in concrete? What about the use of sea water for this purpose?
6. Theoretically derived ideal gradings of aggregates for maximum density should be the most economical, yet the practice is not followed. Can you explain why?
7. Design a concrete mix of M-20. The design stipulations and test data are given below:

**Design stipulations**

Characteristic compressive strength required in the field at 28 days – 20 MPa

Maximum size of aggregate – 20 mm (angular)

Degree of workability – 0.90 compacting factor

Degree of quality control – Good

Type of exposure – Mild

**Test data of materials**

Specific gravity of cement – 3.15

Compressive strength of cement at 7 days – Satisfies the requirement of IS: 269: 1989

Specific gravity of coarse aggregates- 2.60

Specific gravity of fine aggregates- 2.60

Water Absorption –coarse aggregates -0.5 %

Fine aggregates – 1%

**Sieve analysis of fine aggregates**

Sieve sizes	Fine aggregate (% passing)
4.75 mm	100
2.36 mm	100
1.18 mm	93
600 micron	60
300 micron	12
150 micron	2