

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 EXAMINATION- JUNE -2016

B.Tech IV Semester

COURSE CODE: 11B11CE411

MAX. MARKS: 35

COURSE NAME: CONCRETE TECHNOLOGY

COURSE CREDITS: 04

MAX. TIME: 2 HRS

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Use of IS-10262:1982 is allowed.

1. Answer the following questions:

(1 x 10 = 10)

- a) To determine the modulus of rupture what is the standard size of the specimen.
- b) The property of fresh concrete, in which water in the mix tends to rise to surface while placing and compacting, is called as _____.
- c) The property of ingredients to separate from each other while placing the concrete is called _____.
- d) When phenolphthalein indicator is used in the concrete, the pink colour indicates the alkaline nature of concrete. (T/F)
- e) For concrete that are flowable Vee bee apparatus is used to determine workability. (T/F)
- f) As W/C ratio decreases the strength increases but workability decreases, why?
- g) What do you understand by laitance?
- h) Plot the stress strain curve for high strength concrete.
- i) What do you understand by characteristic strength of concrete?
- j) What is the controversy about rapid chloride permeability test?

2. Explain the different steps involved in hydration of concrete? (5)

3. a) Why does air entrainment reduce the strength of moderate- and high-strength concrete mixtures but may increase the strength of low-strength concrete mixtures? (2)

b) Can we use recycled water from industrial operations as mixing water in concrete? What about the use of seawater for this purpose? Can we use recycled water from industrial operations as mixing water in concrete? What about the use of seawater for this purpose? (2)

c) Explain the mechanism of air entrainers. (1)

4. a) What is a truly elastic material? Is concrete truly elastic? If not, why? Describe the various stages of microcracking when a concrete specimen is loaded to failure. (2.5)
- b) Briefly explain the causes and control of D cracking of concrete. What is the origin of laitance and what is its significance. (2.5)
5. a) 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 this phenomenon. (2.5)
- b) A heavily reinforced and massive concrete structure is to be designed for a coastal location in Alaska. As a consultant to the primary contractor, write a report explaining the state of the art on the choice of cement type, aggregate size, admixtures, mix proportions, concrete placement and concrete curing procedures. (2.5)
6. Design a concrete mix for grade M50. Other data is as follows. (5)
- Maximum Size of Aggregate: 20 mm
- Workability: 0.80
- Exposure: Severe
- Specific gravity of cement: 3.15
- Specific gravity of coarse aggregates: 2.65
- Specific gravity of fine aggregates: 2.70
- Water Absorption: C.A- 0.50%
- F.A – 1.0 %
- Sand as % of total aggregate = 25
- Sand is of Zone III