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MID SEMESTER EXAMINATION-2015

B.Tech IV Semester

COURSE CODE: 11B11CE411 MAX. MARKS: 30

COURSE NAME: CONCRETE TECHNOLOGY

COURSE CREDITS: 04 MAX. TIME: 2 HRS

Note: *All questions are compulsory.*

Section A **(Marks: 6 X 1 = 6)**

1. If a clinker is ground finer, will that change the standard consistency of cement produced.
2. What is alite and belite for cement chemists?
3. How is the workability requirement identified for reinforced concrete construction?
4. A Portland cement has the following composition: 60% C_3S, 15% C_2S, 13% C_3A, 12% C_4AF:

   a) Will the cement give high early strength?

   b) Will the cement generate high heat of hydration?

   c) In what type of construction you should not use this type of cement?
5. You are the manager of a cement plant and observed that the construction market is demanding cement that gives high strength at early ages. Your boss does not allow you to change the proportions of the cement compounds but, other than that, he will support any other change that you suggest. What should you do to stay competitive in the market?
6. Superplasticizers can also cause changes in the morphology of hydration products. State true or false and justify.

Section B **(Marks: 3 X 3 = 9)**

1. What would be the volume of capillary voids in a 0.2 water cement ratio paste that is only 50 percent hydrated? Also calculate the water cement ratio needed to obtain zero porosity in a fully hydrated cement paste.
2. Discuss why the strength of interfacial transition zone is generally lower than the strength of the bulk hydrated cement paste. Explain why concrete fails in a brittle manner in tension but not in compression. Also, discuss in detail the hydration mechanism of concrete.

3. In concrete technology, what distinction is made between the terms specific gravity and bulk density? With the help of suitable sketches, explain the following terms and discuss their significance: absorption capacity, saturated surface dry condition and damp condition. Explain Feldsman sereda model and explain its components.

Section C **(Marks: 5 X 3 = 15)**

1. You are a civil engineer incharge of rehabilitating some old concrete pavements in your area. In brief note to your superiors, discuss the equipment needed, deleterious constituents to be avoided, and the cost of economy of using the crushed concrete concrete from old pavements as a source of aggregates for the construction new pavements. Explain in detail the grading of aggregates as per Indian Standard specifications.
2. Some manufacturers claim that application of water reducing admixtures can lower the cement content and increase the consistency and strength of a reference concrete mixture. Explain why all three benefits may not be available at the same time. Also, discuss in detail the mechanism of action of superplasticizers.
3. (a) What is fineness modulus? What is its significance?

   (b) Determine the Fineness Modulus of aggregate for the following result of sieve analysis as given in Table 1. What does the result indicate?

IS Sieve Size	10 mm	4.75 mm	2.36 mm	1.18 mm	600 μm	300 μm	150 μm	75 μm
Percentage passing	100	92	74	55	23	12	9	7

Table 1