Code No: 09A50101 R09

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD
B. Tech III Year I Semester Examinations, May/June – 2013
Concrete Technology
(Civil Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1.a) Discuss briefly the major compounds of portland cement that contribute to the strength development during first few weeks of hydration.
b) Discuss about the structure of hydrated cement. [15]

2.a) Briefly explain about the mineral and chemical admixtures that are being used in concrete.
b) What type of admixtures are required for concreting in hot weather and cold weather? [15]

3.a) Discuss in detail about grading of aggregates? What do you understand by gap graded aggregate?
b) What are the effects of shape and texture of aggregates on the strength and workability of concrete? [15]

4.a) What is 'workability' of concrete? Discuss about the effect of 'Time' and 'Temperature' on workability of concrete.
b) Briefly explain any two methods of determining the workability of fresh concrete. [15]

5.a) Discuss the influence of the rate of load application on the strength of hardened concrete.
b) Briefly discuss about the relation between 'tensile' and 'compressive' strength of concrete. [15]

6.a) Briefly explain the test procedure for 'Flexural strength' of concrete.
b) Briefly explain the non-destructive testing of concrete.
c) What are the factors that affect creep of concrete? [15]

7. Design M30 grade concrete mix as per IS 10262:2009 for the following data.
Cement = OPC 53 grade; Specific gravity of cement = 3.01
Coarse aggregate = 20 mm crushed granite;
Specific gravity of coarse aggregate = 2.78
Fine aggregate = River sand confirming to zone II;
Specific gravity of fine aggregate = 2.77
Method of concreting = Pumping
Quality control = Good; Slump required = 120 mm;
Environmental exposure condition = Moderate exposure condition.
Use of superplasticiser having specific gravity of 1.2 is allowed. Minimum cement content from durability consideration = 320 kg/m^3. Maximum water-cement ratio = 0.45. Assume any other data suitably. [15]

8.a) What is meant by 'self-compacting concrete'? Briefly discuss the various tests to be conducted for the self-compacting concrete.

b) What are the advantages of using fibre-reinforced concrete? Briefly explain how the concrete attains this property. [15]

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