	Uilegh
Name:	
Roll No.:	A distance of Knowledge Staff Confident
Invigilator's Signature :	

CS/M.Tech(SE)/SEM-2/SE-205B/2013 2013

ADVANCED CONCRETE TECHNOLOGY

Time Allotted: 3 Hours Full Marks: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any *five* of the following. $5 \times 14 = 10$

- 1. What are Bogue's compounds? How they are formed? How their relative proportions influence the properties of cement? Discuss the process of hydration of cement. What is heat of hydration? 3+2+3+3+3
- 2. What are the different types of admixtures used in concrete?

 Make a detailed list of both types of admixtures and enumerate their uses. Nowadays use of admixtures have almost become a routine in concrete making, why?

2 + 10 + 2

30490(M.Tech)

[Turn over

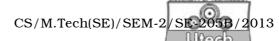
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- 3. What is the difference between hydration in a sealed container and hydration under water? For complete hydration in sealed container of 100 gms of cement what will be the total amount of water required and volume of empty capillary pores on complete hydration? Curing of concrete is essential Why?

 3+8+3
- 4. What is meant by strength of concrete ? What are the parameters that affect concrete strength ? Write a note on Abramis water cement ratio law. What are the different moisture conditions of aggregates. 2 + 4 + 4 + 4
- 5. What are the factors that cause lack of durability of concrete? Enumerate the provisions of IS: 456 in improving the durability of concrete. Write a note on corrosion of reinforcements in concrete. How can it be restricted?

3 + 3 + 4 + 4

Define workability of concrete. What are the factors affect workability. What are the different types of tests performed on hardened concrete? Write a note on cube test as per IS: 516. Distinguish between Destructive and Non-Destructive testing of concrete.



7. Discuss the concept of Trial Mixes in concrete Mix Design.

Design Trial Mix 1 for the data mentioned below:

$$f_{ck}$$
 = 30 MPa.

Maximum size of course aggregates = 20 mm Shape of coarse aggregates = angular Zone of sand used-III

Degree of workability required at site - 150 mm slump.

Type of exposure = mild

Specific gravities —

Cement = 3.15

Coarse aggregates = 2.71

Fine aggregates = 2.62

Assume the aggregates in SSD condition.

4 + 10

8. Distinguish between High strength and High performance concrete? What are the basic attributes of HPC? How to select the suitable ingredients and design a HPC mix? Discuss the role of pozzolanic materials like fly ash and silica fume in making of HPC. 3+3+5+3