



Name : .....

Roll No. : .....

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 ?  
 $2 + 10 + 2$



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 ?  $3 + 3 + 4 + 4$
6. 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.  $2 + 3 + 2 + 4 + 3$



7. Discuss the concept of Trial Mixes in concrete Mix Design. Design Trial Mix 1 for the data mentioned below :

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

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

---