Hall Ticket No | | | | | | | | | | | Question Paper Code: BST205

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

M.Tech I Semester End Examinations (Regular) - February, 2017

Regulation: IARE–R16

ADVANCED CONCRETE TECHNOLOGY

(Structural Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Discuss the manufacturing process of Portland cement in wet and dry method. **[7M]**
   (b) Explain Bogue's compounds and explain in detail the four major Bogue's compounds. **[7M]**
2. (a) Explain in detail the hydration of cement and heat of hydration. **[7M]**
   (b) Explain influence of rate of cooling on the compressive strength of cement. **[7M]**

UNIT – II

3. (a) Discuss the factors affecting the workability of concrete and the tests commonly employed to measure the workability of concrete. **[7M]**
   (b) Explain in detail the slump cone test and also the various patterns of the slump. **[7M]**
4. (a) Discuss the process of manufacture of concrete and various curing methods of concrete. **[7M]**
   (b) Explain the significance of water/cement and the gel/space ratio in the compressive strength of concrete. **[7M]**

UNIT – III

5. (a) Discuss the methods of making high strength concrete in detail. **[7M]**
   (b) Explain the attributes specifically when a high performance concrete is known as the high strength concrete. **[7M]**
6. (a) Discuss the techniques used for producing ultra high strength concrete in detail. **[7M]**
   (b) Explain the factors when a concrete is known as a high strength concrete comparing with the ordinary concrete. **[7M]**

UNIT – IV

7. (a) Explain the classification of the light weight aggregates used in light weight concrete. **[7M]**
   (b) Explain the design of light weight aggregate concrete mix. **[7M]**

8. (a) Explain briefly about the aerated concrete and the no fines concrete and there advantages. **[7M]**

   (b) Discuss the concept of the drying shrinkage of no fines concrete in comparison the Conventional concrete. **[7M]**

UNIT – V

9. (a) Describe the procedure in adopting the IS and DOE methods. **[7M]**

   (b) Design the concrete mix for grade M40 with suitable conditions using the IS code. **[7M]**

10. (a) design the concrete mix for the following data using IS code: **[7M]**
   Characteristic compressive strength=30MPa
   Maximum size of aggregate=20mm (angular)
   Degree of workability = 0.8CF
   Degree of quality control = good
   Type of exposure = very severe
   Water absorption by CA = 1.5%
   Moisture content of FA = 2.0%
   Assume any suitable missing data.

   (b) Design the concrete mix for the grade M25 with suitable conditions using ACI method. **[7M]**
   Find the quantities of constituents of the mix for a bag of cement.