Code No: R100506 **Pre-Ph.D. Examinations. February - 2020**

ADVANCED CONCRETE TECHNOLOGY

Time: 3 hours **Max.Marks:100**

Answer any FIVE questions
All questions carry equal marks
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NOTE: USE OF MIX DESIGN CHARTS PERMITTED.IS OCDES NOT PERMITTED.

1.a) Explain in detail the role of SILICATES in hydration of cement?
b) Explain the difference between continuous grading and gap grading? Also explain their merits and demerits? [10+10]

2.a) Explain the terms 'segregation' and 'bleeding' of concrete? Explain mechanism, reasons and controlling methods?
b) Calculate the Gel/Space ratio and estimate the strength of concrete for 800 grams of cement with 0.6 and 0.7 w/c ration on 75% hydration? [10+10]

3.a) Explain the term EFFECTIVE WATER in concrete? How it can be calculated?
b) Explain in detail different types of shrinkages in concrete? [10+10]

4.a) Explain the reason for keeping the H/D ratio of concrete cylinder as 2. What to do if it is more or less than 2?
b) With neat creep curve explain the creep behavior of concrete? [6+14]

5. Design a M55 grade concrete mix using ERINTROY AND SHAKLOK method for very good quality control. The workability is very low. Cement is OPC 53 grade with a sp.gravity of 3.10.CA is crushed granite 12 mm size with a sp.gravity of 2.65. FA is natural sand of zone II and its sp.gravity is 2.68.The ratio of Fine to Total aggregate is 30%.Assume any other data required suitably. [20]

6. Discuss in detail about the Quality Management System in concrete construction industry? What are the measures to be considered to assess the quality control? [20]

7. Explain in detail about different types of polymer concrete? [20]

8. Write short notes on:
a) Methods of controlling Alkali Silica Reaction
b) Limitations of NDT of concrete
c) Tests for fresh SCC [6+6+8]

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