R18/R16

Code No: 155AQ/135AD

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, March - 2021

CONCRETE TECHNOLOGY

(R18 - Civil Engineering; R16 - Civil Engineering)

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

Answer any five questions
All questions carry equal marks

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Note: No code book or data sheet is allowed:

1.a) Discuss about the structure of hydrated cement.
b) Explain how the water/cement ratio influences the cement paste matrix and the transition zone in concrete. [7+8]

2.a) What is Alkali-aggregate reaction? Discuss the factors that promote Alkali-aggregate reaction.
b) Discuss the reason why the grading limits are specified.
c) Write briefly about the classification of aggregates according to size, shape and texture. [5+5+5]

3.a) What are the various factors which affect the workability of concrete?
b) What is the sampling and acceptance criteria? Explain the IS: 456-2000 code provisions. [7+8]

4.a) Why are shrinkage and creep treated together?
b) Explain the various destructive and non-destructive tests on hardened concrete. [6+9]

5.a) Enumerate the steps involved in the design of concrete mixes using BIS method.
b) Discuss the factors that affect the durability of concrete.
c) What is the role of gradation curves in the concrete mix design? [5+5+5]

6.a) Write short notes on Gap graded aggregate and combined grading of aggregates.
b) Explain how the Bogue's compounds participate in the development of strength of cement. [7+8]

7.a) Explain the rheology of creep and draw the creep curve showing the creep recovery.
b) Calculate the maturity value and estimate the 14 days strength for M25 grade concrete if it is cured at 15^0C from 0 hr to 6 hr; 8^0C from 6 hr to 12 hr and 12^0C for the rest of the period during a day. The Plowman's constants are A=21 and B=61. [7+8]

8.a) What is the sampling and acceptance criteria? Explain the IS: 456-2000 code provisions.
b) Briefly discuss the tests to be conducted to satisfy the requirements for 'self-compacting concrete' in the fresh state.
c) What are the different tests and criterions for self-compacting concrete? [5+5+5]

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