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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(CE) (2011 Onwards) (Sem.-4)
DESIGN OF CONCRETE STRUCTURES-I

Subject Code : BTCE-403

Paper ID : [A1173]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.
4. Any missing data may be assumed appropriately.
5. Use of IS 456:2000 is allowed.

SECTION-A**1. Write briefly :**

- a) What is hydration of cement?
 - b) Differentiate between Quick setting and Rapid Hardening cement.
 - c) What is fineness modulus? Give its value for coarse aggregates.
 - d) What is modular ratio? Determine for M20 grade of concrete.
 - e) Define factor of safety and load factor.
 - f) List circumstances under which doubly beam is required.
 - g) Name method for proportioning of concrete mixes.
 - h) Write Abram's and its significance.
 - i) Write functions of main steel and distribution steel in slabs.
 - j) What do you mean by flexural shear cracks?
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SECTION-B

2. Give chemical composition of cement with their percentages.
3. Discuss mechanical properties of aggregates.
4. Describe various exposure conditions considered in mix design of concrete.
5. A reinforced concrete beam of breadth 250 mm and effective depth 500 mm is reinforced with 4 Nos. 20 mm bars in the tension zone and 3 Nos 16 mm bars in compression zone. The effective cover to compression reinforcement is 30 mm. Determine the moment of resistance of the section if M20 concrete and Fe415 grade steel are used.
6. Mention the difference in design principles for L Beam and T Beam.

SECTION- C

7. (a) What do you understand by workability? How it is measured?
(b) Explain Target mean strength and Characteristic strength.
8. Design a rectangular reinforced concrete beam section to resist a factored bending moment of 200 kNm, a torsional moment of 70 kNm and a factored shear force of 100 kN using M20 concrete and Fe415 grade steel.
9. (a) Write note on Bond and development length. Why it is provided?
(b) Design a one way slab for an office floor which is continues over the tee beams spaced at 3.5 m intervals. Assume a live load of 4 kN/m² and adopt M20 grade concrete and Fe415 HYSD bars.