

Roll No.

Total No. of Pages : 02

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

Subject Code : BTCE-403

M.Code : 56085

Date of Examination : 07-07-22

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 have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.
4. Assume missing data.

SECTION-A

1) Answer briefly :

- a) Explain bulking of sand.
- b) Explain term segregation.
- c) What is Target strength.
- d) What are the differences between nominal and design mix?
- e) Define Modulus of Rupture.
- f) What is the codal recommendation of torsion steel in two-way slab?
- g) What is equivalent shear as applied to torsion and shear in IS 456?
- h) Which section you would prefer out of under-reinforced sections and over-reinforced section? Give the reasons in support of your answer.
- i) What is the difference between lap length and anchorage length?
- j) Define Characteristic strength.

SECTION-B

- 2) Explain grading of Fine and Coarse aggregates.
- 3) How will you determine the workability of concrete by slump test? Explain what are the limitations of slump test.
- 4) A 300mm wide and 600mm deep R.C beam is reinforced with 2 legged 10mm inclined stirrups at 200mm c/c with $\alpha=45^\circ$. Longitudinal steel consists of 4 bars of 20mm with a cover of 40mm. If concrete grade is M20 and grade of steel is Fe415, determine the strength of the section in shear.
- 5) Design a one-way slab having a span of 3m for a factored superimposed load of 8KN/m^2 .
- 6) Describe the various exposure conditions considered in mix design of concrete.

SECTION-C

- 7) A T-beam floor consists of 12cm thick R C slab monolithic with 25cm wide beams. The beams are spaced at 3.5m center to center and their effective span is 6.5m. If the superimposed load on the slab is 6 kN/m^2 , design an intermediate beam, use M-25 mix and Fe 250 grade steel.
- 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) Explain the following:
 - a) Steel Properties.
 - b) Working stress method.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.