



GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

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Name of Examination : **Winter 2020** - (Preview)

Course Code & Course Name : **CE302 - Design of RCC Structures**

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Maximum Marks : **60**

Duration : **3 Hrs**

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Answer Key Submission Type: No marking scheme and solution

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.
6. IS:456-2000, IS 875, SP-16 are allowed

1) Solve any two sub-questions

- a) Explain over reinforced section, under reinforced section and balanced section. [6]
- b) State and explain assumptions made in limit state of collapse in flexure. [6]
- c) A T beam as shown in fig 1 is subjected to a factored moment of 400 kNm. Design the steel reinforcement for flexure. The materials are M20 concrete and HYSD steel reinforcement of grade Fe415. [6]

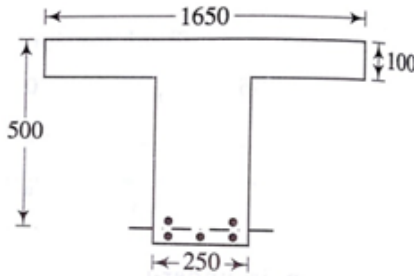


Fig. 1

2) Solve following sub-question.

- a) The main stair of an office building has to be located in a stair measuring 3.5 m x 5.5 m. The vertical distance between the floors is 3.75 m. Design the stairs, allowing a live load of 2 kN/m². Use M20 concrete and fe415 steel. [10]

3) Solve all sub-questions.

- a) A simply supported rectangular beam of 6 m span carries a characteristic load of 24 kN/m inclusive of its self weight. The beam is 230 mm x 600 mm overall. Design the beam if it is resting on RCC columns. The materials are M20 concrete and HYSD steel reinforcement of grade Fe415. [10]
- b) Design a square pad footing for an axially loaded column of 450 mm x 450 mm. The SBC of the soil is 190 kN/m². Load on column is 850 kN. [10]

4) Solve all sub-questions.

- a) Design a two way slab for a room of size 4m x 5m with discontinuous and simply supported edges on all the sides with corners prevented from lifting to support a live load of 4 kN/m². Assume suitable additional data; if required. Take check for shear stress, deflection and cracking. [9]
- b) Design a short column to carry an axial load of 1600 kN. It is 4 m long, effectively held in position and restrained against rotation at both ends. Use M 20 concrete and Fe 415 steel. [9]