

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.ARCH. - SEMESTER-IV EXAMINATION – SUMMER 2019

Subject Code: 1045003

Date: 16/05/2019

Subject Name: Structure-IV

Time: 10:30 AM TO 12:30 PM

Total Marks: 50

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of IS: 456-2000 is permitted

- Q.1** (a) Explain Briefly: Limit state method **05**
(b) Define: (i) Characteristic strength (ii) Characteristic load (iii) Cover (iv) Effective cover (v) Neutral axis **05**
(c) Explain various types of Slabs with neat sketches **05**
- Q.2** (a) Explain Balanced sections, Under reinforced section, Over reinforced section. **05**
(b) Design a rectangular R C beam as per IS 456. The beam is simply supported on effective span of 5 m. and subjected to factored load of a UDL 30 kN/m including self weight. Use M 20 concrete and Fe-415. Sketch details **10**
- OR**
- (b) A doubly reinforced beam of 300mm X 500mm overall is reinforced with 2-20mm dia. bars as compression reinforcement and 4-20mm dia. bars as tensile reinforcement. Effective cover on both sides is 50mm. M-20 grade of concrete and Fe-415 grade of steel bar is used. Compute moment of resistance. **10**
- Q.3** (a) Design a square RCC short column subjected to axial working load of 800 kN. Take M 20 grade concrete and Fe –415 steel. Draw reinforcement details. **10**
- OR**
- (b) Explain the structural classification of Stair Cases with neat sketches. Draw detail of reinforcement in staircase from the following data for one flight.(i)Landing width = 1.2 m , Riser =150 mm, Tread = 300 mm (ii) Waist slab overall thickness = 200 mm.(iii) Main steel = 12 mm dia. at 120 mm c/c.(iv) Distribution steel = 8 mm dia. bars at 175 mm c/c.(v) Effective cover = 25 mm.(vi) Assume landings on both the sides and no. of steps 10 **10**
- Q.4** (a) Design isolated square footing for a square column 400 mm x 400 mm for axial load of 800 kN. Use concrete grade M – 20 and Fe – 415 steel grade. Take safe bearing capacity of soil 160 kN/ m² **10**
- OR**
- (b) Design a simply supported one way slab of 7.0m X 3.0m clear span supported on 300mm thick walls on two sides. Assume all necessary data **10**
