

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE Arch. – SEMESTER – IV • EXAMINATION – SUMMER • 2014

Subject Code: 1045003

Date: 29-05-2014

Subject Name: Structure – IV

Time: 10:30 am - 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) and SP-16 is permitted

- Q.1** (a) Differentiate between the “Working stress Method” and “Ultimate Load method”. **04**
- (b) Define: (i) Limit State of Collapse and (ii) Limit State of Serviceability. **03**
- (c) Show the behavior of one way slab and two slab under bending with sketch. **03**
- Q.2** (a) Differentiate between behavior of Long Column and Short column with neat sketches. **05**
- (b) Differentiate between singly reinforced and double reinforced beams with neat sketches. **05**

OR

- (b) Explain : (i) Balanced Section, (ii) Over reinforced Section and (iii) Under reinforced Section. Which type of section is preferred ? Why ? **05**
- Q.3** Design a rectangular beam having 230 mm width as per IS 456 – 2000. The beam is simply supported on effective span of 6m. The service load including self weight is 30 kN/m. Use M20 grade concrete and Fe – 415 steel. Also sketch the detailing of the designed beam. Take partial safety factor = 1.5 for load. **10**

OR

- Q.3** Explain various types of footings with neat sketches. **10**
- Q.4** Design (i) longitudinal steel and (ii) lateral ties, required to carry a working load of 2000 kN on a rectangular column of size 300 x 400 mm. The grade of concrete and steel are M20 and Fe 415 respectively. Assume that the column is short. Also sketch the detailing. **10**

OR

- Q.4** Select the suitable dimensions of an isolated footing for an RCC column of size 230 mm x 230 mm which carries a vertical load of 800 kN. The safe bearing capacity of soil is 200 kN/m². Use M20 and Fe 415 respectively. **10**
- Q.5** Design a simply supported one – way slab over an effective span of 4m. It carries a total factored load of 8 kN/m². The width of supporting wall is 230 mm. Adopt M-20 concrete & Fe-250 steel. Sketch the details. **10**

OR

- Q.5** Explain the structural classification of Stair Cases with neat sketches. **10**
