

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE Arch. – SEMESTER – IV • EXAMINATION – WINTER • 2014**

**Subject Code: 1045003**

**Date: 01-12-2014**

**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) What are limit states? Explain in Brief. **04**  
(b) Define: “Characteristic strength” and “Characteristic load”. **03**  
(c) Differentiate between behavior One way slab and Two slab with sketch. **03**
- Q.2** (a) Differentiate between behavior of Long Column and Short column with neat sketches. **05**  
(b) What are the partial safety factors ? State the same for loads and materials. **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 is subjected to a factored load of 50 kN/m including the self weight. Use M20 grade concrete and Fe – 415 steel. Also sketch the detailing of the designed beam. **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 1000 kN on a rectangular column of size 300 x 300 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** Determine the dimensions of an isolated footing for an RCC column of size 300 mm x 300 mm which carries a vertical load of 1000 kN. The safe bearing capacity of soil is 200 kN/m<sup>2</sup>. 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/m<sup>2</sup>. The width of supporting wall is 230 mm. Adopt M-20 concrete & Fe-250 steel. Sketch the details. **10**
- OR**
- Q.5** Explain with neat sketches, various structural elements of a building and the transfer of load from one element to the other. **10**

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