

GUJARAT TECHNOLOGICAL UNIVERSITY
B.ARCH - SEMESTER- IV • EXAMINATION – SUMMER 2017

Subject Code: 1045003

Date: 05/05/2017

Subject Name: Structure –IV

Time: 10.30AM to 12.30PM

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)** Write merits and demerits of limit state method **04**
(b) Define: (1) Characteristic load (2) Partial safety factor (3) Limit state **03**
(c) Explain long column and short column with sketch. **03**
Q.2 (a) Differentiate between under reinforced and over reinforced beam **05**
(b) State and explain various types of slabs based on L/B ratio and support conditions. **05**

OR

- (b)** Write design steps to design two-way slab simply supported on masonry walls. **05**
Q.3 Design a rectangular R C beam as per IS 456 having 300 mm width. The beam is simply supported on effective span of 3.6 m. and subjected to factored load of a UDL 45 kN/m including self weight. Use M 20 concrete and Fe-415. Sketch details. **10**

OR

- Q.3** Explain (1) Balanced, Over reinforced and Under reinforced section (2) Various types of footings with sketches **10**
Q.4 A short column of size 300 mm x 400 mm is reinforced with six bars of 20 mm diameter. Determine the safe load a column can carry if M-20 grade of concrete and Fe-250 steel is used. Also find the spacing of lateral ties and sketch the details of reinforcement. **10**

OR

- Q.4** Design an isolated square pad footing for the RCC column of size 400 mm x 400 mm to transmit axial load of 800 kN. The safe bearing capacity of soil is 160 kN/m². Use M-20 concrete and steel Fe-415. No check for shear is required. Sketch the details in plan in cross section. **10**
Q.5 Design a slab for office room of 3.2 m x 8.5 m size. The slab is resting on 300 mm thick wall and resisting live load of 2.5 kN/m². Use M-20 concrete mix and Fe-415 steel. Check the slab for control of deflection. Sketch details. **10**

OR

- Q.5** Draw details of reinforcement of single flight stair having (1) Landing width= 1.2 m, Riser= 125 mm, Tread=300 mm, Waist slab thickness=200 mm, effective cover=25 mm (2) Main steel= 16 mm dia. Bars at 100 mm c/c (3) Distribution steel=8 mm dia. bars at 150 mm c/c. (4) Assume landing on both side and no. of steps=12 nos. **10**
