

GUJARAT TECHNOLOGICAL UNIVERSITY

BA – SEMESTER – 4 - EXAMINATION – SUMMER 2018

Subject Code: 1045003

Date: 17-May-2018

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) Explain Briefly: Working state method. [4]
(b) (i) Calculate design compressive strength of M 25 concrete (ii) Find modulus of elasticity of M 25 concrete (iii) Calculate design strength of Fe 415 steel. [6]
- Q.2** (a) A singly RC beam has effective dimension of 250mm X 450mm. It is reinforced with 3-20mm dia. of Fe 415. Find out moment of resistance of beam. Use M20 [5]
(b) A doubly reinforced beam of 300mm X 600mm overall is reinforced with 4-20mm dia. bars as compression reinforcement and 6-20mm dia. bars as tensile reinforcement. Effective cover on both sides is 50mm. M-25 grade of concrete and Fe-415 grade of steel bar is used. Compute moment of resistance [10]
- OR**
- Q2.** (b) A short R.C.C column of size 300mm X 400mm is reinforced with 6 bars of 20mm dia. Determine the safe load column can carry if M-20 grade of concrete and Fe 250 steel is used. Also find the spacing of lateral ties and draw required sketch. [10]
- Q.3** (a) Write Difference for Balanced sections, Under reinforced section, Over reinforced section. [5]
(b) Design and detail two way simply supported slab of 2.5m x 3.75m. 150 mm thick slab is supported by 350 mm thick brick wall and live load on slab is 3.0 kN/sqm. Take value of α_x & α_y from IS 456. Take M20 and Fe 415 grade of material. [10]
- OR**
- Q.3** (a) Differentiate between one way and two way slabs [5]
(b) Design a one way continuous slab having three equal spans of 3.5 m effective with following data. (1) Imposed load = 4 kN/ m² (2) Floor finish = 1 kN/ m² (3) Concrete M-20 and steel Fe-250 grade. Sketch the design details [10]
- Q.4** (a) Design an isolated square pad footing for the RCC column of size 400 mm x 400 mm to transmit axial load of 850 kN. The safe bearing capacity of soil is 180 kN/ m². Use M-20 concrete and Fe-415 steel. No check for shear is required. Sketch the details [10]
- OR**
- Q.4** 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]
