

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BARCH - SEMESTER- IV • EXAMINATION – WINTER 2016

Subject Code: 1045003

Date: 19/11/2016

Subject Name: Structure-IV

Time: 02.30 pm – 04.30 pm

Total Marks: 40

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Make suitable and proportionate sketches wherever necessary.
5. Use of IS 456 (2000) and SP-16 is permitted.

Que.		Marks
1.	a. Define characteristic strength.	01
	b. Calculate Minimum area of steel for RCC Column of size 300 x 600. Take M20 & Fe 415.	01
	c. Define depth of neutral axis for rectangular RCC Beam.	01
	d. What “415” indicate in Fe415 for reinforcement?	01
	e. Explain Effective span with neat sketch.	01
	f. What is meaning of M25?	01
	g. State the different forms of limit state of serviceability.	02
	h. Draw sketch for Isolated sloped footing plan and section with structural details.	02
2.	a. Draw one way slab and two way slab load distribution.	03
	b. Design and detail simply supported slab of 2.6 m x 6 m. Take slab thickness 150 mm and live load on slab is 2.5 kN/m ² . Slab is supported by 350 mm thick beam. Take M20 and Fe 415 grade of material.	07
	OR	
	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.	07
3.	a. Write Difference for Balanced sections, Under reinforced section, Over reinforced section.	03
	b. Design a rectangular beam having size of 300mm x 600mm as per IS 456. The Beam is simply supported for span of 5.5 m. The service dead load including self-weight 14.5 kN/m & live load is 20 kN/m. Take M25 and Fe 500.	07
4.	a. What are the criteria to decide pitch and diameter of column?	03
	b. Design a short R.C. column to resist an axial characteristic load of 1200KN. Use material M20, Fe 415. Draw neat sketch.	07
5.	a. List out various types of foundations and explain any one.	03
	b. Design and draw sketch for a Rectangular isolated footing with uniform thickness for axial load of 1700 kN, Assume self-weight of footing 10% of axial Load. SBC of soil is 200 kN/m ² . Take M20 and Fe 415 grade of material. Take column size 300mm x 600mm. Shear Check not required.	07
	OR	
	b. Explain with neat sketch following terms related to stair case (i) Flight (ii) Landing. Draw detail of reinforcement in staircase from the following data for one flight.	07
	(i) Landing width = 1.5 m, Riser = 150 mm, Tread = 300 mm	
	(ii) Waist slab overall thickness = 150 mm.	
	(iii) Main steel = 12 mm dia. at 125 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	
