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/m^2. 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^2 . 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**

****