Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–VIII EXAMINATION – WINTER 2015

Subject Code:X80602 **Date:11/12/2015**

Subject Name: Structural Design-II

Time: 2:30pm to 5:00pm **Total Marks: 70**

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, IS 875 (Part I,II,II), IS 3370 (Part I,II,III,IV) and SP-16 is allowed.**
5. **Use M-20 grade concrete and Fe-415 grade steel if not mentioned.**

Q.1	**(a)**	Prepare a typical structural lay out for G+3 storey building having 4 bays 0f 4m in X –direction and 3 bays of 5 m in Y-direction. Design an interior panel two way slab. Floor height is 3 m. Live load on floor is 4 kN/m^2. Floor finish is 1 kN/m^2. Draw neat sketch of reinforcement detailing.	**14**
Q.2	**(a)**	Explain provision of drainage in retaining wall with neat sketch. Also explain types of retaining wall with their use in various conditions.	**07**
	(b)	Design a circular water tank with flexible base for 400000 liter. Depth of the tank is 4 m. Assume concrete grade M25 and Fe415 grade steel. Tank is situated on the ground.	**07**
		OR	
	(b)	Design a circular water tank for the same data as above but with fixed base. No need to design the base slab. Use approximate method.	**07**
Q.3	**(a)**	For the cantilever retaining wall of height 5m, fix the basic dimensions of the various elements. Angle of repose of soil is 30° and density of soil is 17 kN/m^3. SBC of soil is 150kN/m^2. Friction coefficient between soil and concrete is 0.55. Design stem of the retaining wall. Show theStability check for sliding and overturning.	**14**
		OR	
Q.3	**(a)**	For the counterfort retaining wall of height 7m above G.L., fix the basic dimensions of the various elements. Angle of repose of soil is 30°. SBC of soil is 200 kN/m^2 and density of soil is 17 kN/m^3. Friction coefficient between soil and concrete is 0.60. Design and detail the heel of retaining wall.	**14**
Q.4	**(a)**	Fix the dimensions of circular overhead water tank container with flat bottom for a capacity of 5 lakh liters. Design and detail top spherical dome, top ring beam and cylindrical wall of the container. Take live load 1 kN/m^2 and diameter of tank 10m. Use M25 grade concrete and Fe 415 steel.	**14**
		OR	
Q.4	**(a)**	Design a RCC water tank of 6 m × 4 m with a maximum depth of 4 m of water using IS 3370 for fixed base condition. Use M30 concrete and Fe 415 grade of steel.	**14**

Q.5 (a) Estimate wind load and plot wind pressure diagram for a multi storey building of plan area 12 m X 12 m situated on flat topography for the following data. **14**

Height of building = 28 m
Bottom Storey height = 4 m
All other storey height = 3 m
Bay width in both direction = 4 m
location of Building = Ahmedabad,
Terrain Category= II
Design life 100 years.

OR

Q.5 (a) Design and detail a slab type rectangular combined footing to support the columns carrying 800 kN and 1000 kN at 4 m spacing. Their square column sizes are 400 mm and 500 mm respectively. The SBC of soil is 230 kPa and width of footing is 1.8 m. **14**

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