Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BA - SEMESTER–VI EXAMINATION – WINTER 2018

Subject Code:1065004 Date:03/12/2018

Subject Name:Structure VI

Time:02:30 PM TO 04:30 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) & IS -3370 is permitted**

Q.1	**(a)**	Sketch the deflection profile and reinforcements details of cantilever retaining wall.	**05**
	(b)	Draw typical bending pattern, shear force and bending moment diagram for combined rectangular footing. And also locate the critical section.	**05**
	(c)	Design effective depth of a rectangular footing for two columns A and B carrying loads of 600 kN and 800 kN respectively. Column A is 300 mm X 300 mm and column B is 400 mm X 400 mm in size. The centre to centre spacing of the columns is 3.5 m. The SBC of soil is 180 N/mm^2. Use M 20 concrete and Fe 415 grade steel	**10**
Q.2	**(a)**	Write various forces acting on retaining wall with sketch and describe active earth pressure by Rankine Theory for (i) Dry or moist backfill with no surcharge and (ii) Submerged backfill	**06**
	(b)	Explain the stability condition for cantilever retaining wall with diagram for (i) Stability against overturning (ii) Stability against sliding and (iii) Maximum pressure at base and no tension at base	**06**
	(c)	Write down the steps to calculate retaining wall.	**08**
		OR	
Q.2		Fix the basic preliminary dimensions of various components including stem of a cantilever retaining wall to retain the earth of height 7 m above lower ground level and carry out stability checks. Also design the stem and do the structural detailing. Take SBC of soil = 210 kN/m^2 $\emptyset = 30^0$, $\mu = 0.5$, Unit weight of soil = 15 kN/m^3 . Use M 20 grade of concrete and Fe-415 grade.	**20**
Q.3	**(a)**	Fix the basic dimension and design the top dome of Intze type container elevate water tank to store 3 lakh litre water. Draw the Sketch. If the height of container is 15 meter, Wind load 2 kN/ m2 & Soil Bearing Capacity of 200 kN/m^2. M20 & Fe 415 grade of steel.	**10**

****