Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.ARCH. - SEMESTER–VI EXAMINATION – SUMMER 2019

Subject Code: 1065004 **Date: 16/05/2019**
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 and SP-16 is permitted**

Q.1		Draw typical bending pattern, shear force and bending moment diagram for combined rectangular footing.	**05**
Q.2	**(A)**	Design effective depth of a rectangular footing for two columns A and B carrying loads of 1000 kN and 1500 kN respectively. Each column size is 400 mm X 400 mm. The centre to centre spacing of the columns is 4 m. The SBC of soil is 280 kN/m². Use M 20 concrete and Fe 415 grade steel.	**10**
	(B)	Define masonry. Explain different types of joints in Stone Masonry.	**05**
		OR	
	(B)	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	**05**
Q.3	**(A)**	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	**05**
	(B)	Give the difference between: 1. Combine Footing & Continuous Footing, 2. Grillage Foundation & Raft Foundation, 3. Deep Foundation & Shallow Foundation, 4. Stepped Foundation & Simple Footing.	**10**
		OR	
	(A)	Explain dimensional details of different types of Bricks.	**05**
	(B)	Design a thickness of stem of a cantilever retaining wall having 5.5m high embankment above ground level. Unit weight of soil = 18 kN/m3.The angle of repose = 30°. The SBC of soil = 175 kN/m². The coefficient of friction = 0.5. Use M 20 concrete and Fe 415 steel.	**10**
Q.4	**(A)**	What are the causes of failure of foundation? Explain each.	**05**
	(B)	Sketch neat diagram of circular overhead water tank showing various elements and describe design steps to design (i) Top spherical dome (ii) Top ring beam (iii) Cylindrical wall and (iv) Base slab for tank supported on circular wall and tank supported on ring beam.	**10**
		OR	
	(A)	Draw sketch showing behavior of various components, deflection profile and reinforcement details for counter fort retaining wall.	**05**
	(B)	Fix the basic dimensions and design the top dome of Intze type of elevated water tank to store 10 Lac litres. The height of staging = 18 m upto bottom of tank. The SBC of soil = 235 kN/m². The intensity of wind pressure = 1.5 kN/m². Use M30 concrete and HYSD reinforcement of Fe 415. Sketch the dimensions of Intze tank.	**10**

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