Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2014

Subject code: 1721503 Date: 20-06-2014

Subject Name: Advanced Foundation Engineering

Time: 02:30 pm - 05:00 pm Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	What are the points to be considered while fixing the depth of foundation?	**07**
	(b)	A square footing 3m × 3m carries a gross pressure of 350kN/m^2 at a depth of 1.2m in sand. A saturated init weight of sand is 20kN/m^3 and the unit weight above the water table is 17kN/m^3. The shear strength parameters are c$\hat{o}$ = 0 and $\blacklozenge\hat{o}$ = 30^0. Consider N_q and N_γ as 22 and 20 respectively. Determine factor of safety with respect to shear failure when water table is at (i) 5m and (ii) 1.2m below the ground level. Use IS code method.	**07**
Q.2	**(a)**	What are the different types of bearing capacity failure? Describe their typical characteristics with sketches.	**07**
	(b)	Explain with the help of neat sketches, various application of soil reinforcement.	**07**
		OR	
	(b)	A strip footing of 2m wide is resting at 4m below the ground surface. Determine the net ultimate bearing capacity using Terzaghi, Skempton and IS code method. The shear strength parameters are c = 10kN/m^2 and $\blacklozenge$ = 0. Consider unit weight of soil is 20kN/m^3.	**07**
Q.3	**(a)**	What are the different conditions under which pile foundation is used?	**07**
	(b)	Explain well foundation with typical sketch and discuss criteria for determining grip length of well foundation.	**07**
		OR	
Q.3	**(a)**	Describe construction of under reamed pile foundation with neat sketches.	**07**
	(b)	What are the different measures to be taken at site to counteract the tilts in the well during sinking operation?	**07**
Q.4	**(a)**	Give the different design criteria for impact type machine foundation as per IS code.	**07**
	(b)	Define: period, frequency and natural frequency, free and forced vibration, resonance, damping.	**07**
		OR	
Q.4	**(a)**	What is meant by vibration isolation? How is it done?	**07**
	(b)	What do you understand by soil-structure interaction?	**07**
Q.5	**(a)**	What is bore log? Show a typical bore log and explain its utility.	**07**
	(b)	Define modulus of subgrade reaction and explain its test procedure as per IS code.	**07**
		OR	
Q.5	**(a)**	Enlist the causes of settlement and discuss the methods to reduce settlement in building.	**07**
	(b)	Explain different functions and properties of geotextiles in detail.	**07**

****