PRN:		Course Code:	CET2709

Final Year **B. Tech.** End Semester Examination Winter 2024 000939

Advanced Foundation Engineering

Day and Date: Fri 29 NOV 2024 Max Marks: **50**

Time: 10:30AM To 12:30PM Duration: **02** hrs

Instructions: All questions are compulsory.

			Marks	Bloom's Level	CO
Q.1	**Attempt the following**				
	a)	Discuss various types of shallow foundations.	06	L2	1
	b)	A trapezoidal footing is to be produced to support two square column of 30cm and 50cm sides resp. Columns are 6m apart and the SBC of the soil is 400 kN/m^2. The bigger column carries 5000kN and smaller carries 3000kN load. Design a suitable size of the footing so that it does not extend beyond the faces of the columns.	06	L3	1
		OR			
	b)	Explain criteria to decide location and depth of shallow foundation.	06	L2	1
Q.2	**Attempt any two from following**				
	a)	Write a brief design steps for conventional method for design of raft foundation.	06	L2	2
	b)	Discuss I.S. Code method of analysis of raft foundation.	06	L3	2
	c)	Explain types of raft foundation.	06	L3	2
Q.3	**Attempt following questions**				
	a)	Explain classification of pile foundation	06	L2	3
	b)	A group of 9 piles with diameter and length of each pile as 25 cm and 10 m respectively, is used as a foundation in soft clay deposit. Taking the unconfined compressive strength of clay as 120 kN/m^2 and the pile spacing as 100 cm c/c, find the load capacity of the group. Assume the bearing capacity factor N_c = 9 and adhesion factor = 0.75. A factor of safety of 2.5 may be taken.	07	L2	3
		OR			
	b)	Write a note on under reamed pile foundation.	07	L2	3

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Q.4	**Attempt following questions**				
a)	Define the following: i. Degree of freedom ii. Free and Forced vibrations. iii. Resonance	06	L2	3
b)	What are the different types of machine foundations. Explain with figures.	07	L2	4
	OR			
b)	A foundation block of weight 30kN rests on soil for which stiffness may be assumed as 25×10^3 kN/m. The machine vibrated vertically by an exciting force of 3 sin (30t). Find the natural frequency, natural period, natural circular frequency and the amplitude of vertical displacement. Take damping factor as 0.5.	07	L3	4

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