Total No. of Printed Pages: 02

PRN No.	

PAPER CODE	U314-224 (ESE)

(AY:2024-25) December 2024 (ENDSEM) EXAM

SY (SEMESTER - I)

COURSE NAME: Foundation Engineering **Branch: Civil Engineering** **COURSE CODE: CVUA31204**

(T.Y PATTERN 2020)

Time: [1Hr 30 Min] **[Max. Marks: 40]**

(*) Instructions to candidates:

1) **Figures to the right indicate full marks. Use of scientific calculator is allowed**
2) **Use suitable data wherever required**
3) **All questions are compulsory. Solve any two sub question each from Questions 1 and 2.**
4) **Solve any one sub question (2 marks) from Questions 3 ,4 ,5 and 6 and sub question of 4 marks is compulsory from questions 3,4,5, and 6**

Q. No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Explain various corrections to be applied to calculate corrected N number in standard penetration test?	[4]	CO-1	Understanding
	b) Enlist the factors affecting the sample disturbance. Determine the area ratio of shelly tube sampler having inside and outside diameters 111 mm and 114 mm respectively.	[4]	CO-1	Understanding
	c) Explain electrical resistivity in accordance with, 1. Principle 2. Procedure with sketch 3. Limitations	[4]	CO-1	Understanding
Q2	a) Discuss how you will determine the depth and number of boreholes for important projects.	[4]	CO-2	Apply
	b) A square foundation 1.5 m x 1.5 m in plan. The soil supporting the foundation has a friction angle $\emptyset = 20^0$ and c =15.22 kN/m^2. The unit weight of soil = 17.8 kN/m^3. Determine the allowable gross load on the foundation with F.O.S. 4 assume that the depth of foundation is 1 m and general shear failure occur in soil. Take Nc=17.69, Nq = 7.44 , $N\gamma$ =3.64.	[4]	CO-2	Apply
	c) A strip of 2 m is founded at a depth of 4 m below the ground surface. Determine the net ultimate bearing capacity using Terzaghi's equation, The soil is clay, C = 10 kN/m^2, the unit weight of soil is 20kN/m^3, (Nc = 5.7, Nq = 1 and N_γ =0.0. for Terzaghi's).	[4]	CO-2	Apply

Q3	a) Define i) Normally consolidated soil ii) Over consolidated soil	[2]	CO-3	Understanding
	OR			
	b) What is immediate settlement? Explain how, it is evaluated.	[2]	CO-3	Understanding
	c) Explain the concept of elastic settlement of foundation and calculate the immediate settlement of foundation at center by using given data as circular foundation 18m diameter, contact pressure 225 kN/m^2, poisons ratio 0.40, E=40,000kN/m^2, influence factor =1.12.	[4]	CO-3	Apply
Q4	a) Explain the effect of negative skin friction on pile?	[2]	CO-4	Understanding
	OR			
	b) Explain methods of determining pile capacity.	[2]	CO-4	Understanding
	c) By making use of pile load test on field, explain the procedure to determine the ultimate bearing capacity of single pile	[4]	CO-4	Apply
Q.5	a) What is caisson? Enlist its uses.	[2]	CO-5	Understanding
	OR			
	b) Explain any two engineering problems associated with black cotton soil	[2]	CO-5	Understanding
	c) Explain 'swelling pressure test' with neat sketch.	[4]	CO-5	Apply
Q.6	a) Define the following terminologies correlated with earthquake. i) Epicenter ii) Focus iii) Focal depth iv) Epicentral distance	[2]	CO-6	Understanding
	OR			
	b) Explain with a neat sketch, the mechanism of reinforced soil.	[2]	CO-6	Understanding
	c) Explain the application of geosynthetic material in different area with suitable example with sketch.	[4]	CO-6	Apply