Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

B. Tech (Fifth Semester - Regular) Examinations, November 2025

23BCVPE35011 – Foundation Engineering

(Civil Engineering)

Time: 3 hrs Maximum: 60 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

		CO #	Blooms Level
Q.1.	Answer ***ALL*** questions		
a.	What are the essential soil conditions required for the applicability of Boussinesq's stress distribution theory?	CO1	K2
b.	What is an isobar diagram, and how does it help in visualizing stress distribution below loaded areas?	CO2	K2
c.	State the factors that influence the adhesion between pile surface and surrounding clay.	CO3	K2
d.	What condition of soil movement leads to the development of active earth pressure on a retaining wall?	CO4	K2
e.	State the main differences in stability characteristics between finite and infinite soil slopes.	CO5	K3

PART – B **(10 x 5 = 50 Marks)**

		Marks	CO #	Blooms Level
	Answer ***ALL*** the questions			
2. a.	A concentrated load of 2500 kN acts on the surface of a homogeneous soil mass of a large extent. Find the stress intensity at a depth of 8 meters. (a) directly under the load (b) at a horizontal distance of 5 metres.	5	CO1	K3
b.	What are the Common Methods for Calculating Stress Distribution in Soil? Explain it	5	CO1	K2
	(OR)			
c.	What is the use of Newmark's chart? Explain the procedure for using the chart.	5	CO1	K3
d.	A strip footing of width B = 3 m is subjected to a uniform pressure load q = 250 kN/m^2. At a depth of z = 4 m, determine the vertical stress increase at x = 3, and 0 m.	5	CO1	K3
3.a.	Discuss the IS code method for computing bearing capacity.	5	CO2	K3
b.	What are the factors to be considered in the selection of piles.	5	CO2	K2
	(OR)			
c.	What are the different types of settlements which can occur in a foundation? How are those estimated	5	CO2	K4
d.	What are the various components of a well foundation? What are their uses	5	CO2	K2
4.a.	Explain the direct, semi-direct and indirect methods of soil exploration?	5	CO3	K2
b.	Explain Standard Penetration test and its correlations with shear strength parameters. What are the corrections to be applied for SPT value?	5	CO3	K3
	(OR)			
c.	Explain in detail the electric resistivity method.	5	CO3	K2

d.	What are the fundamental requirements of sampling tube.	5	CO3	K2
5.a.	State the assumptions in Coulomb's theory of Earth pressure?	5	CO4	K2
b.	Determine the passive earth pressure by Rankine's theory per unit run for a retaining wall 4m high with i=15°φ=15 ° and γ=19 kN/m^3.The back face of the wall is smooth and vertical	5	CO4	K3
	(OR)			
c.	A retaining wall 9.0 m high retains a cohesionless soil. The backfill surface is level with the top of the wall. The unit weight of the top 3 m of the fill is 21 kN/m3 , with an angle of internal friction 300 and that of the rest is 27 kN/m^3 , with an angle of internal friction 330 . A surcharge of 10 kPa is applied on the top of the backfill. Find the magnitude and point of application of the resultant active thrust.	5	CO4	K4
d.	Discuss the various types of failures that can occur in a retaining wall and explain the factors influencing each mode of failure.	5	CO4	K3
6.a.	Discuss the influence of pore water pressure on the stability of slopes with suitable expressions.	5	CO5	K4
b.	What is a stability chart? Explain how Taylor's stability charts are used in slope stability analysis.	5	CO5	K3
	(OR)			
c.	Explain the Culmann's method of analysis of stability of slopes	5	CO5	K3
d.	Explain with a neat sketch the slope failure mechanisms.	5	CO5	K2

--- End of Paper ---