

--	--	--	--	--	--	--	--	--	--



GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022
B. Tech Degree Examinations, December – 2020
(Seventh Semester)
BCEPC7010– GEOTECHNICAL ENGINEERING-II
(Civil Engineering)

Time: 2hrs

Maximum; 50 Marks

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions)**(1 x 10= 10 Marks)**

Q.1. Answer ALL questions	[CO#]	[PO#]
a. Rankine's theory of earth pressure assumes that the back of the wall is (i) Plane and smooth (ii) Plane and rough (iii) Vertical and smooth (iv) Vertical and rough	1	2,3
b. Coefficient of earth pressure at rest is (i) Less than active earth pressure but greater than passive earth pressure (ii) Greater than active earth pressure but less than passive earth pressure (iii) Greater than both the active earth pressure and passive earth pressure (iv) Less than both the active and passive earth pressures	1	2,3
c. Coulomb's wedge theory assumes that (i) Back fill is dry, cohesionless, homogeneous and isotropic (ii) Slip surface is the plane which passes through the heel of the wall (iii) Position and direction of the resultant earth pressure are known (iv) All the above	1	2,3
d. Terzaghi's theory of one dimensional consolidation assumes (i) Soil is homogeneous and fully saturated (ii) Water and soil particles are incompressible (iii) Deformation of the soil, is entirely due to change in volume (iv) All the above	3	2
e. The ultimate bearing capacity of a soil, is (i) Total load on the bearing area (ii) Safe load on the bearing area (iii) Load at which soil fails (iv) Load at which soil consolidates	3	2
f. Select the incorrect statement (i) Bearing capacity of a soil depends upon the amount and direction of load (ii) Bearing capacity of a soil depends on the type of soil (iii) Bearing capacity of a soil depends upon shape and size of footing (iv) Bearing capacity of a soil is independent of rate of loading	3	2
g. Under-reamed piles are generally (i) Driven piles (ii) Bored piles (iii) Precast piles (iv) All the above	2	2
h. Number of piles required to support a column, is (i) 1 (ii) 2 (iii) 3 (iv) 4	2	2
i. Which sample has preserved natural structure of soil	4	2

- (i) Undisturbed (ii) Disturbed
 (iii) Non-representative (iv) Remoulded
- j. The shear resistance of a soil is constituted basically of the following 5 2
 component.
- (i) The frictional resistance to translocation between the individual soil particles at their contact point (ii) To the structural relation to displacement of the soil because of the interlocking of the particles
 (iii) Cohesion and adhesion between the surfaces of the soil particles (iv) All the above

PART – B: (Short Answer Questions)

(2 x 5 = 10 Marks)

Q.2. Answer ALL questions

	[CO#]	[PO#]
a. State the different graphical methods for finding earth pressure	1	2,3
b. What is settlement of foundation	3	2
c. Define shallow foundation according to Terzaghi,s	2	2
d. What causes negative skin friction	2	2
e. What is trench footer	4	2

PART – C: (Long Answer Questions)

(6 x 5 = 30 Marks)

Answer ANY FIVE questions

	Marks	[CO#]	[PO#]
3. A retaining wall 4 m high retains cohesion less backfill; the ground surface sloping at an angle of 100° (β) with the horizontal. The back of the wall is inclined to the vertical at a positive batter angle of 90° , $\gamma = 19 \text{ kN/m}^3$, $\phi = 30^\circ$ wall friction 12° . Determine the total active pressure by Coulomb's method.	(6)	1	2,3
4. State the different types of retaining walls. Explain any one in detail	(6)	1	2,3
5. A strip footing of 2m width is founded at a depth of 4m below the ground surface. Determine the ultimate bearing capacity using Terzaghi's equation. The soil is clay ($\phi = 0^\circ$, $c = 10 \text{ kN/m}^2$). The unit weight of the soil is 20 kN/m^3	(6)	3	2
6. What are the different types of settlements which can occur in a foundation? How are those estimated	(6)	3	2
7. Describe various types of pile foundations	(6)	2	2
8. What is 'negative skin friction' on pile and why does it cause concern? How do you estimate its value in clay and sandy soil? Suggest means of controlling it	(6)	2	2
9. Write short notes on in-situ vane shear test	(6)	5	2
10. Draw a neat sketch of split spoon Sampler showing all the salient parts	(6)	4	2

--- End of Paper ---