QPC: RD20BTECH357 AR 20 Reg. No

GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Fifth Semester – Regular) Examinations, December – 2022

BPCCV5030 – Geotechnical Engineering-II

(Civil Engineering)

Time: 3 hrs Maximum: 70 Marks

Answer ALL Questions

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. If the angle of internal friction decreases, then Ka _____	CO1	PO1
(i) decreases (ii) increases (iii) equal to zero (iv) does not change		
b. The general exploration gives information about which of the following features?	CO1	PO1
(i) Depth of rock (ii) Composition of soil strata (iii) Ground water level (iv) All of the mentioned		
c. The various method of site exploration can be grouped under, which of the following?	CO3	PO2
(i) Open excavations and Borings (ii) Soil strata (iii) None of the mentioned (iv) All of the mentioned		
d. The Newmark's influence chart consists of _____	CO4	PO1
(i) a single circle only (ii) a number of circles and radiating lines (iii) bar diagram (iv) small rectangular unit areas		
e. The pressure intensity beneath the footing depends upon _____	CO2	PO1
(i) Rigidity of the footing (ii) Soil type (iii) Condition of soil (iv) All of the mentioned		
f. The material retained by the retaining wall is known as_____	CO2	PO2
(i) roof (ii) slab (iii) backfill (iv) footing		
g. During the active state of plastic equilibrium, the retaining wall moves _____	CO3	PO1
(i) towards the fill (ii) away from the fill (iii) does not change its position (iv) remains in equilibrium		
h. In cohesive soil, the pressure distribution beneath the footing is _____	CO2	PO1
(i) Linear (ii) Non linear (iii) Zero (iv) None of the mentioned		
i. When do strap footings are used in foundation?	CO2	PO2
(i) To transfer load of an isolated column (ii) Distance between the columns are long (iii) Two column loads are unequal (iv) All of the mentioned		
j. When two column loads are unequal, which of the possible footing can be provided?	CO4	PO1
(i) Strap footing (ii) Raft footing (iii) Trapezoidal combined footing (iv) Mat footing		

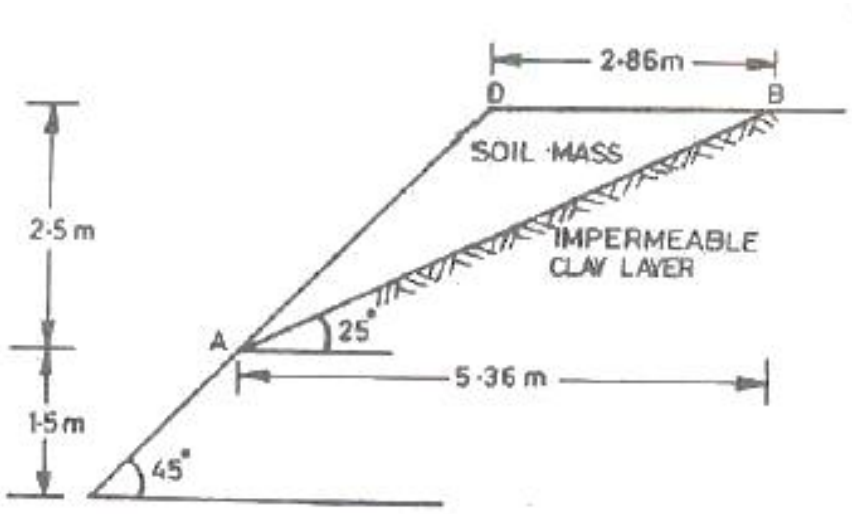
PART – B: (Short Answer Questions) **(2 x 10 = 20 Marks)**

Q.2. Answer ***ALL*** questions		[CO#]	[PO#]
a.	What is finite slope? Give example of finite slope. Also enlist various types of finite slope with neat sketches.	CO1	PO1
b.	Make the sketch of contact pressure of sand and clay soil for Rigid foundation.	CO2	PO2
c.	Write the assumptions of Terzaghi's Theory of Bearing Capacity.	CO2	PO1
d.	A concentrated load of 2000 kN is applied at the ground surface. Determine the vertical stress at a point P which is 6m directly below the load.	CO2	PO2
e.	The unit weight of soil in a uniform deposit of dense sand (K_o = 0.5) is 18 kN/m^3. Determine the geostatic stresses at a depth of 2.5m.	CO2	PO1
f.	Write the advantages of Newmark Influence Chart.	CO3	PO1
g.	Enlist various forces which are considered in Swedish circle method.	CO4	PO3
h.	What is shallow foundation? Enlist various shallow foundations	CO2	PO3
i.	What is Stability Number and Stability Factor?	CO4	PO1
j.	Difference between Rankine earth pressure theory and Coulomb's Earth Pressure Theory.	CO1	PO3

PART – C: (Long Answer Questions) **(4 x 10 = 40 Marks)**

		Marks	[CO#]	[PO#]
3. a.	Derive the expression of Factor of Safely for Wedge Failure	4	CO1	PO1
b.	What is Pile? Classify the pile based on: (i) Method of construction, (ii) Material used, (iii) Cross-section of pile	6	CO2	PO3
	(OR)			
c.	Derive the expression for Vertical Stresses induced in the soil due to the application of Line Load.	5	CO2	PO2
d.	What is Deep Foundation? Enlist various types of Deep Foundation with neat sketches.	5	CO1	PO1
4. a.	Derive the expression for Factor of Safely and Critical Height for stability of an Infinite Slope of DRY Cohesive Soil	5	CO2	PO2
b.	A strip footing of 3m width is founded at a depth of 4m below the ground surface on clay soil. Determine the net ultimate bearing capacity using (i) Terzaghi's equation and (ii) IS code method. Where c = 10 kN/m^2 and the unit weight of soil is 20 kN/m^3 (Take Nc = 5.7, Nq=1.0 and Nγ = 0; s_c = 1.2, d_c = 1; i_c =1)	5	CO3	PO1
	(OR)			
c.	Explain (i) Rotational Slope Failure (ii) Translational Slope Failure (iii) Compound Failure (iv) Wedge Slope Failure	4	CO3	PO1

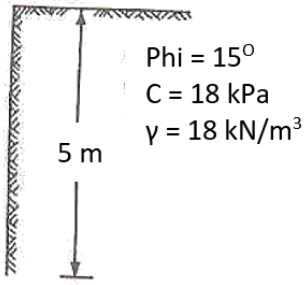
d.	(i) Define Wedge Failure. (ii) A soil mass is resting on an inclined impermeable clay layer. Determine FoS against Wedge Failure along interface (c = 6 kPa and phi = 20^o and unit weight = 17 kN/m^3)	2+4	CO3	PO3



5. a.	What is earth pressure? Define various Rankine Earth pressures in details.	5	CO4	PO3
b.	Write the assumptions of Rankine Earth Pressure Theory. Derive the expression for Rankine coefficient of Passive earth pressure.	5	CO4	PO3

(OR)

c.	Explain Immediate Settlement, and consolidation settlement.	2	CO2	PO2
d.	Explain Friction Circle Method of stability analysis in Detail.	8	CO2	PO1
6. a.	Explain in details the types of Retailing wall with neat sketches.	5	CO1	PO2
b.	Determine the stresses at the top and bottom of the cut as shown in figure. Also determine the maximum depth of potential crack and maximum depth of unsupported excavation.	5	CO1	PO1



(OR)

c.	Explain the procedure of Pile load test with schematic diagram and load settlement curve.	6	CO2	PO1
d.	Define the following (i) Negative Skin Friction (ii) Pile Driving	4	CO4	PO1

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