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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree (S,FE) Examination January 2023 (2015 Scheme)

Course Code: CE305

Course Name: GEOTECHNICAL ENGINEERING - II

Max. Marks: 100 Duration: 3 Hours

(Assume data where ever necessary)

PART A

Answer any two full questions, each carries 15 marks. ***Marks***

1 a) Two columns A and B are 6 m apart. Concentrated load on column A is 400 kN and on B is 350 kN. Calculate vertical stresses in soil 6m below the column foundations vertically below column A (5)

b) A retaining wall retains a stratified backfill with following properties
First layer: Height = 4m , $\phi = 35°$, c= 0 and $\gamma = 18$ k N/m^3.
Second layer: Height = 2 m , $\phi = 33°$ c = 0 and $\gamma = 17$ k N/m^3.
Water table is 4 m below GL. Determine the total passive pressure / metre run and its point of application (10)

2 a) What are the assumptions of Rankine's theory of earth pressure? (5)

b) What is a Newmark Chart ? (5)

c) What is an Isobar? What is its use? (5)

3 a) A retaining wall 5 m high supports a cohesive backfill with cohesion 25 kN/m^2 and $\gamma = 18$ kN/m^3. Determine the Total active earth pressure after the formation of tension crack (5)

b) What are the assumptions of Boussinesq theory? (5)

c) Explain the effect of surcharge q on active earth pressure on a retaining wall of height H m supporting a cohesionless backfill with unit weight γ and angle of internal friction γ (5)

PART B

Answer any two full questions, each carries 15 marks.

4 a) What are the elements of a well foundation? (5)

b) A square footing of 2m width is laid at a depth of 2m in sand .Determine the ultimate bearing capacity if a) water table rises to the ground level b) water table is at base level. $\phi = 30°$ and $\gamma = 18$ kN/m^3. Bearing capacity factors are $N_c = 30.14$, $N_q = 18.4$, $N_\gamma = 22.4$.Assume general shear failure (10)

5 a) What are the factors affecting bearing capacity of soil ? (5)

	b)	What are the causes of differential settlement ? How it can be controlled?	(5)
	c)	Explain Preloading	(5)
6	a)	What is a floating foundation ?	(5)
	b)	Explain how tilts and shifts of well foundation can be prevented.	(10)

PART C

Answer any two full questions, each carries20 marks.

7	a)	What is negative skin friction? How is it determined for a group of piles?	(5)
	b)	What are the objectives of soil exploration programme	(5)
	c)	Explain Standard Penetration test	(10)
8	a)	What is vibration Isolation ? How it can be prevented?	(6)
	b)	Explain Plate load test with a neat sketch . How ultimate bearing capacity of soil is determined from Plate load test?	(14)
9	a)	What is the criteria to be adopted for designing a machine foundation	(5)
	b)	Explain the IS guidelines for fixing spacing and depth of exploration	(5)
	c)	Explain any two boring techniques adopted in soil exploration programme	(10)

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