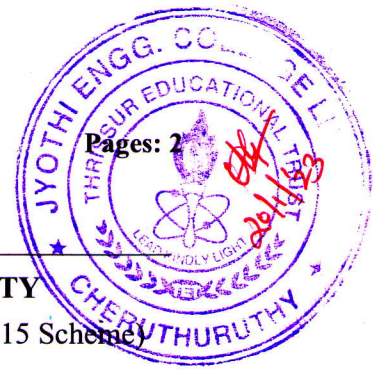


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Reg No.: _____

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 , $\phi = 35^\circ$, $c = 0$ and $\gamma = 18 \text{ kN/m}^3$.
Second layer: Height = 2 m , $\phi = 33^\circ$ $c = 0$ and $\gamma = 17 \text{ kN/m}^3$.
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/m² and $\gamma = 18 \text{ kN/m}^3$. 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. $\phi = 30^\circ$ and $\gamma = 18 \text{ kN/m}^3$. 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 carries 20 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)
