



R20 Regulation

Subject code:3E7AE

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VII Semester Supplementary Examinations, April 2024

**FOUNDATION ENGINEERING
(CIVIL ENGINEERING)**

Maximum Marks: 70

Date:23.04.2024 Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10X2M=20 Marks)

- 1 List out Various methods of soil exploration?
- 2 When auger bore sampler is used for sampling?
- 3 Define Stability Number.
- 4 How is the depth of exploration decided?
- 5 Write assumptions of Rankine's theory
- 6 What are the types of retaining wall in civil engineering structures?
- 7 Define Safe bearing capacity.
- 8 Write the importance of settlement criteria?
- 9 What are the different shapes of well foundation?
- 10 What are the various types of piles based on their function?

Part-B

Answer All the following questions

(5X10M=50Marks)

- 11 A. Difference between disturbed and undisturbed soil samples? [5M]
B. How would you decide the depth of exploration in subsoil exploration? List out factors you consider and their importance. [5M]

OR

- 12 A. Explain sub soil investigation methods in detail. [5M]
B. Describe plate load test with figure. [5M]
- 13 A. Explain the importance of factor of safety of infinite slopes. [5M]
B. A hard stratum exists at a depth of 6 m parallel to the ground surface. find the critical angle of an infinite slope in a clay soil having $c=25 \text{ Kk/m}^2$, $\Phi = 26^\circ$, $G=2.72$ and $e=0.90$, assume soil is dry. [5M]

OR

- 14 Explain stability analysis of infinite slopes for cohesionless and cohesive soils for various conditions. [10M]
- 15 A. What are the assumptions of coulombs theory? Explain the advantage of coulombs theory over Rankine's theory? [5M]
B. Derive an expression for active earth pressure? [5M]

OR

- 16 A. Explain the different types of earth pressures with practical examples. [5M]
 B. How you will estimate the total active earth pressure experienced by a retaining wall with a vertical back retaining a cohesion less soil? [5M]
- 17 A square column foundation is to be designed for a gross allowable total load of 250 KN. If the load is inclined at an angle of 15° to the vertical, determine the width of the square shape foundation. Take factor of safety of 3.0. Use $\gamma = 19 \text{ kN/m}^3$, $\phi = 35^\circ$, $c = 5 \text{ kN/m}^2$. Depth of foundation is 1.0 m. Take $N_c = 46.12$, $N_q = 33.30$, $N_\gamma = 48.03$ [10M]
 OR
- 18 A. Determine the ultimate bearing capacity of a square footing $1.5 \text{ m} \times 1.5 \text{ m}$ in size located at a depth of 1.2 m in a pure clay with an unconfined strength of 140 kN/m^2 having properties of $\phi = 0^\circ$ and $\gamma = 17.5 \text{ kN/m}^3$. [5M]
 B. A square footing rests on a uniform thick deposit of stiff clay with an unconfined compressive strength of 120 kPa. The footing is located at 1.2 m below the ground surface and is to carry a total load of 1000 kn. The unit weight of clay soil 20 kN/m^3 and ground water level is at a great depth and its effect can be ignored. Determine the dimension of square footing required for the loading and soil conditions given with a factor of safety of 3. [5M]
- 19 A. Explain pile load test with neat sketch? [5M]
 B. Explain about negative skin friction with a neat sketch? [5M]
 OR
- 20 Explain various components on well foundation with neat sketch. What are their uses. [10M]