



Regulation: R18

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

Subject code: 2P6AB

B.Tech VI Semester Supplementary Examinations, June/July 2023

FOUNDATION ENGINEERING
(CIVIL ENGINEERING)

Maximum Marks: 70

Date: 24.06.2023 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.
 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

- 1 List Various methods of soil exploration?
- 2 What is Augur boring?
- 3 Define finite and infinite slope.
- 4 What are the different methods used for analysis of finite slope.
- 5 What is Earth's pressure coefficient?
- 6 What is Coulomb theory?
- 7 Define ultimate bearing capacity?
- 8 What are the types of shallow foundation?
- 9 List Various methods of soil exploration?
- 10 What is negative skin friction?

(10x2M = 20 Marks)

Part-B

Answer All the following questions.

(5x10M = 50 Marks)

- 11 a. What is reconnaissance? What type of information is obtained in reconnaissance survey?
What is its use?
b. Describe Split spoon sampler with figure. [5+5]
- 12 a. Write down the salient features of a good sub soil investigation report.
b. Explain various bore hole types with figure. [5+5]
- 13 Explain Swedish arc method of slope stability analysis. Derive an expression for the factor of safety. [10]
- 14 Explain stability of slopes on earthen dams under different conditions. [10]
- 15 A soil mass retaining wall of 6 m height with smooth vertical back. The backfill done by two types of soils in layers. Top 4 m height soil parameters ($c = 10\text{KN/m}^2$, $\phi = 10^\circ$, $\gamma = 18\text{KN/m}^3$) and from 4 m to 6 m soil parameters ($c = 0$, $\phi = 30^\circ$, $\gamma_{\text{sat}} = 22\text{KN/m}^3$) Calculate the total active earth pressure on the retaining wall. Also calculate the line of action of lateral force from the base of the wall. [10]

OR

16 A retaining wall 6 m height retains sand with $\phi = 30^\circ$, $\gamma = 24\text{KN/m}^3$ upto a depth of 3 m from top. From 3 m to 6m, the material is a cohesive soil with $c = 20\text{KN/m}^2$, $\phi = 20^\circ$. Unit weight of cohesive soil is 18KN/m^3 . A uniform surcharge of 100KN/m^2 acts on the top of soil. Determine the lateral pressure acting on the wall and its point of application. [10]

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 $N_c = 46.12$, $N_q = 33.30$, $N_{\gamma} = 48.03$. [10]

OR

- 18 a. Explain Terzaghi's theory?
 b. Plate load tests were conducted in c- ϕ soil, on plates of two different sizes and the following results were obtained. [5+5]

| Load | Size of plate | Settlement |
|--------|---------------|------------|
| 40KN | 0.3 m x 0.3 m | 25 mm |
| 100 KN | 0.6 m x 0.6 m | 25 mm |

Find the size of square footing to carry a load of 800 KN at the same specified settlement of 25 mm

- 19 a. Discuss the situations where a well foundation is more suitable than other types of foundation.
 b. What are the forces acting on well Foundation? [5+5]

OR

- 20 a. What is pile foundation? [5+5]
 b. How would you estimate the load carrying capacity of pile in cohesive and cohesionless soils?