



R18 Regulation

Subject code: 2P4AE

## TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

**B.Tech IV Semester Supplementary Examinations, September 2023**

### Soil Mechanics

(CE)

**Maximum Marks: 70**

**Date: 23.09.2023 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

(10x2M=20 Marks)

- 1 Define void ratio, porosity and derive relation between "e" and "n".
- 2 Define density index or relative density.
- 3 Define Darcy's law.
- 4 What is Quick Sand?
- 5 What are the assumptions of Boussinesq's theory?
- 6 Differentiate between compaction and consolidation.
- 7 What is initial consolidation?
- 8 Define coefficient of volume change.
- 9 What is liquefaction of sands?
- 10 State the principles of direct shear test?

#### Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 In a compaction test on a soil, the mass of wet soil when compacted in the mould was 1.855 kg. the water content of the soil was 16%. If the volume of the mould was 0.945 liters, determine the dry density, void ratio, degree of saturation and percentage air voids. Take  $G = 2.68$ . (10M)

OR

- 12 What is the use of classification of soils? Discuss Indian standard classification system. (10M)

- 13 Describe pumping-out methods for the determination of the coefficient of permeability in the field. What are their advantages and disadvantages? What are Dupits's assumptions? (10M)

OR

- 14 Explain constant head permeability test and falling head permeability tests for the determination the co-efficient of permeability. (10M)

- 15 What are the different methods of compaction adopted in the field? How would you select the type of roller to be used? (10M)

OR

- 16 Describe standard proctor test and the modified proctor test. How would you decide whether the soil should be compacted the dry optimum or the wet of optimum? (10M)
- 17 How would you determine the time-settlement curve in the field? (10M)
- OR
- 18 Discuss Terzaghi's theory of consolidation, stating the various assumptions and their validity. (10M)
- 19 Explain in detail the determination of shear strength using direct shear test. (10M)
- OR
- 20 Explain in detail the determination of shear strength using unconfined compression test. (10M)