Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2023**

**Subject Code:3160616 Date:18-07-2023**

**Subject Name:Foundation Engineering**

**Time:10:30 AM TO 01:00 PM Total Marks:70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

| | | | Marks |
|---|---|---|---|
| **Q.1** | **(a)** | What is reconnaissance? What type of information is obtained in reconnaissance? | **03** |
| | **(b)** | Write short note on: Raft foundation. | **04** |
| | **(c)** | Describe the standard penetration test. How the observed N-Value is corrected? | **07** |
| **Q.2** | **(a)** | Define following terms (i)Safe bearing capacity (ii) Net ultimate bearing capacity (iii)Foundation | **03** |
| | **(b)** | Describe the split spoon sampler. What is its use? | **04** |
| | **(c)** | Explain seismic refraction method. What are its limitations? | **07** |
| | | **OR** | |
| | **(c)** | Explain Rankine's theory of bearing capacity and derive the equation for depth of foundation by Rankine's theory. | **07** |
| **Q.3** | **(a)** | In which conditions the raft foundation is preferred. | **03** |
| | **(b)** | Discuss the various soil samplers used for obtaining undisturbed soil samples. | **04** |
| | **(c)** | Describe the static cone penetration test. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Draw the sketch of split spoon sampler with all details. | **03** |
| | **(b)** | Write short note on: Floating foundation. | **04** |
| | **(c)** | Explain pile load test to determine the bearing resistance of pile. | **07** |
| **Q.4** | **(a)** | Give name for method to determine the pile capacity | **03** |
| | **(b)** | How do you estimate the group capacity of piles in sand and clay? | **04** |
| | **(c)** | Define Group efficiency of piles and Explain Feld's rule for group efficiency of piles. Determine the efficiency of group of nine piles (3x3) by Feld's rule. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Write a short note on pile driving equipment's. | **03** |
| | **(b)** | Give method to determine the pile capacity and explain any one in detail. | **04** |
| | **(c)** | Enlist different types of foundations provided in expansive soils and explain any one. | **07** |
| **Q.5** | **(a)** | Enlist the situation where pile foundations are preferred. | **03** |
| | **(b)** | Explain type of Retaining walls with neat sketches. | **04** |
| | **(c)** | Describe various types of piles based on method of installation. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Define : 1) free swell index 2) Swelling potential 3) Swelling pressure | **03** |
| | **(b)** | Enlist various application areas of geosynthetics. | **04** |
| | **(c)** | Discuss stability criteria of cantilever retaining wall. | **07** |

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