**TED (21)5014B**
**(Revision – 2021)**

**2109230019**

**Reg. No……**
**Signature…….**

# DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2024

## GROUND IMPROVEMENT TECHNIQUES

[Maximum Marks: **75**] [Time: **3** Hours]

### PART-A

**I. Answer '*all*' the following questions in one word or one sentence. Each question carries *'one'* mark.**

**(9 x 1 = 9 Marks)**

| | | Module Outcome | Cognitive level |
|---|---|---|---|
| 1. | Sheep foot rollers are ideal for compaction of----------type of soil. | M1.02 | U |
| 2. | Zero air void line corresponds to----------degree of saturation. | M1.02 | U |
| 3. | The moisture content at maximum value of dry density is known as---------- | M1.02 | R |
| 4. | The process of injecting a fluid like material into the soil for improving the soil properties is known as ---------- | M2.03 | R |
| 5. | Groutability is defined as the ratio of----------and-------- | M2.03 | R |
| 6. | The raw materials used for the manufacturing of geosyanthetics are------- | M3.04 | U |
| 7. | Type of geosynthetics used as flexible barriers and liners are---------- | M3.04 | A |
| 8. | Consolidation is the process of elimination of--------and--------from the soil. | M4.01 | U |
| 9. | The unit of measurement of Coefficient of consolidation (Cv) is ---------- | M4.03 | A |

### PART-B

**II. Answer any '*eight*' questions from the following. Each question carries *'three'* marks.**

**(8 x 3 = 24 Marks)**

| | | Module Outcome | Cognitive level |
|---|---|---|---|
| 1. | List the various mechanical methods available for ground improvement. | M1.01 | R |
| 2. | Name the various dewatering systems. | M1.03 | U |
| 3. | Write notes on compaction and compaction curve. | M1.02 | U |
| 4. | Write notes on solution and suspension grouts. | M2.03 | U |
| 5. | List the various objectives of grouting. | M2.03 | U |
| 6. | Write notes on bituminous stabilization. | M2.01 | U |
| 7. | Write notes on the application of grouting in dam seepage control. | M2.04 | U |
| 8. | List the various functions of geosynthetics. | M3.04 | U |
| 9. | Differentiate between geotextile and geogrid. | M3.04 | A |
| 10. | Write notes on the sand drains. | M4.04 | U |

**PART-C**

**Answer '*all*' questions from the following. Each question carries *'seven'* marks.**

**(6 x 7 = 42 Marks)**

| | | Module Outcome | Cognitive level |
|---|---|---|---|
| III. | Explain the various types of rollers used for shallow surface compaction of soil. | M1.02 | R |
| | **OR** | | |
| IV. | Explain about stone columns and their mechanism of installation. | M1.04 | R |
| V. | Explain the various application of grouting. | M2.04 | U |
| | **OR** | | |
| VI. | Discuss on the soil stabilization using cement. | M2.01 | U |
| VII. | Explain the soil reinforcement and its mechanism. | M3.01 | U |
| | **OR** | | |
| VIII. | Explain the various civil engineering applications of geosynthetics. | M3.04 | A |
| IX. | Write notes on the various types of geosynthetics and its functions. | M3.04 | U |
| | **OR** | | |
| X. | Explain the function of geosynthetics when used as soil reinforcement. | M3.04 | A |
| XI. | Write notes on the preloading techniques. | M4.04 | U |
| | **OR** | | |
| XII. | List the differences between consolidation and compaction. | M4.01 | U |
| XIII. | Write notes on vertical drains. | M4.04 | U |
| | **OR** | | |
| XIV. | Explain the Terzaghi's spring analogy test for consolidation. | M4.02 | R |

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