TED (21)5014B
(Revision – 2021)

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Reg. No……
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2025

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.	Name the type of roller which uses compressed air to develop inflation pressure for compaction of soil.	M1.02	R
2.	State any two major reasons for carrying out dewatering in soil at a site.	M1.03	R
3.	The injection of slurry or liquid solution under pressure into soil or rock formation is called----------	M2.03	R
4.	List different methods of soil stabilization.	M2.01	R
5.	Identify any two desirable characteristics of a grout.	M2.03	R
6.	Defines soil reinforcement.	M3.01	R
7.	List factors that work in favour of using geosynthetics in many geotechnical applications.	M3.04	R
8.	Define compressibility of soil.	M4.03	R
9.	The soil spring analogy model proposed by Terzaghi is applicable to the process of----------	M4.01	R

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.	Explain the classification of ground improvement techniques.	M1.01	U
2.	Illustrate the concept of 'deep well system' used for dewatering.	M1.03	U
3.	Identify the type of rollers that must be selected under the following conditions a) Finishing operations after compaction of fills and compacting granular base course of highways. b) Effective for compacting cohesive as well as cohesionless soil. c) Compaction of cohesive soils.	M1.02	A
4.	Define the following terms: a) Groutability ratio b) Thixotropy c) Permanence.	M2.03	R

5.	Identify the various applications of grouting.	M2.03	U
6.	List the factors affecting cement stabilization.	M2.01	R
7.	Recognize the type of geosynthetic from the following description a) Porous geosynthetics that resemble a thick strong cloth with its fibers visible b) Mesh like geosynthetics with square or rectangular apertures c) Impervious, thick and flexible sheets usually smooth surfaced	M3.04	A
8.	List different types of elements used as reinforcement in soil reinforcement.	M3.02	R
9.	Differentiate between compaction and consolidation.	M4.01	U
10.	Plot the e vs log p curve (e- voids ratio, p- effective pressure) and define the term 'compressibility' of soil .	M4.03	R

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 method of standard Proctor test used for determining the moisture density relationship of soil.	M1.02	U
	OR		
IV.	Identify a suitable method of drainage/dewatering used for silty sand and outline its procedure with a neat sketch.	M1.04	A
V.	Explain the concept of bituminous stabilization of soil along with its construction method.	M2.01	U
	OR		
VI.	Explain any two methods of grouting adopted for ground improvement with the help of a neat sketch.	M2.03	U
VII.	Explain the mechanism of soil reinforcement which improves the properties of soil.	M3.01	U
	OR		
VIII.	Describe the sequence of construction of a reinforced earth wall with neat sketches.	M3.03	U
IX.	Discuss in detail regarding the properties of Geosynthetics used for soil stabilization.	M3.04	U
	OR		
X.	Identify the major engineering functions of a geosynthetic when used for the following construction works and conditions of soil a) Pavement and railway tracks b) Retaining wall c) Soft soils of low bearing capacity d) Canals, embankments.	M3.04	A

XI.	Identify and summarize any two methods of improving the properties of clay formation by accelerating consolidation.	M4.04	A
	OR		
XII.	Describe Terzaghi's soil spring analogy model for explaining consolidation.	M4.02	U
XIII.	Describe the procedure for finding the coefficient of consolidation in the laboratory.	M4.03	A
	OR		
XIV.	Discuss the various stages of consolidation.	M4.03	R

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