

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-GURUJADA VIZINAGARAM

III B. Tech I Semester Regular Examinations, November -2025

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (Part-A and Part-B)
 2. Answer ALL the question in Part-A
 3. Answer any **FIVE** Questions, each Question from each unit from **Part-B**
 4. All Questions Carry **Equal** Marks

<u>PART-A (10x2Marks=20M)</u>			
1.	a)	Define in-situ densification of soils.	[2M]
	b)	Differentiate between vibro-compaction and dynamic compaction.	[2M]
	c)	What is lime stabilization? Mention its advantages.	[2M]
	d)	List the chemical stabilizers used for soil improvement.	[2M]
	e)	Write short notes on well point systems.	[2M]
	f)	Mention the criteria for selecting filter materials around drains.	[2M]
	g)	Define geosynthetics and their main functions.	[2M]
	h)	What are geogrids and where are they used?	[2M]
	i)	State the basic components of reinforced earth.	[2M]
	j)	What is grouting? List any two objectives of grouting.	[2M]
<u>PART-B (5x10Marks=50M)</u>			
<u>UNIT-I</u>			
2		Explain in detail the various in-situ densification methods used for granular soils.	[10M]
		(OR)	
3	a)	Describe the different preloading techniques used for cohesive soils.	[5M]
	b)	Discuss the applications and limitations of stone columns.	[5M]
<u>UNIT-II</u>			
4		Explain the mechanical and chemical stabilization methods used for soil improvement with suitable examples.	[10M]
		(OR)	
5		Discuss in detail the bituminous and polymer stabilization techniques used in pavement construction.	[10M]
<u>UNIT-III</u>			
6	a)	Describe the working principles of single-stage and multi-stage well point systems.	[5M]
	b)	Explain electro-osmosis and its role in soil dewatering.	[5M]
		(OR)	
7		Explain different types of dewatering systems and their suitability for various soil conditions.	[10M]
<u>UNIT-IV</u>			
8		Explain the functions, types, and engineering applications of geosynthetics.	[10M]

		(OR)	
9	a)	Discuss the applications of geotextiles and geomembranes in civil engineering works.	[5M]
	b)	Explain the role of gabions and geocells in erosion control and slope stabilization.	[5M]
		UNIT-V	
10		Explain the design principles and stability checks involved in reinforced earth retaining walls.	[10M]
		(OR)	
11		Discuss the objectives, materials, and stages involved in grouting operations in soils and rocks.	[10M]