Code No: **R194201I** **R19** **Set No. 1**

IV B.Tech II Semester Regular Examinations, April– 2023

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

*****

UNIT I

1	a)	Discuss about blasting technique used in in-situ densification. Give an expression for calculating the radius of influence of a blasting technique.	[8]
	b)	What is a sand drain? How is it constructed and is useful in densifying cohesive soil deposits?	[7]
		(OR)	
2	a)	Explain various insitu densification methods for cohesive soils.	[7]
	b)	What is vertical drain explain the design of vertical drain?	[8]

UNIT II

3	a)	Explain the working of a vacuum well point system.	[7]
	b)	What is the function of permanent drainage systems installed after construction?	[8]
		(OR)	
4		Explain in brief the principle, equipment used, installation and operation and precaution adopted in electro-osmotic dewatering.	[15]

UNIT III

5	a)	Explain the stabilization of expansive soils by calcium chloride.	[7]
	b)	Write clear on the utilization of fly ash in civil engineering applications.	[8]
		(OR)	
6	a)	Explain the grout materials used in ground improvement.	[7]
	b)	Explain hydraulic fracturing in soils and rocks.	[8]

UNIT IV

7	a)	What is reinforced earth? Explain the principles of reinforced soil walls.	[7]
	b)	Explain the components of reinforced soil.	[8]
		(OR)	
8	a)	Explain the factors governing in design of reinforced soil walls.	[8]
	b)	What are the materials required for construction of a reinforced soil structure?	[7]

UNIT V

9	a)	Write clear note on the gabion wall technique with help of neat sketch.	[7]
	b)	Explain various types of geotextiles with functions and their applications.	[8]
		(OR)	
10	a)	Explain about the properties of geo-membranes.	[7]
	b)	Explain in detail the applications of Geosynthetics with help sketches.	[8]

Code No: **R194201I** **R19** **Set No. 2**

IV B.Tech II Semester Regular Examinations, April– 2023

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

*****

UNIT I

1	a)	Describe the vibroflotation technique of densifying granular soil.	[7]
	b)	Discuss the important formulae used in the improvement of soft clay deposits using stone columns.	[8]
		(OR)	
2	a)	Explain the advantages of geo drains when compared with sand drains.	[7]
	b)	What are the factors affecting densification of soils?	[8]

UNIT II

3	a)	Explain how vacuum well points can be effectively used for dewatering in cohesive soils?	[7]
	b)	Explain the working of a single-state well point system.	[8]
		(OR)	
4	a)	What is the criterion for selection of fill material around drains?	[7]
	b)	Describe in brief the foundation drains and blanket drains.	[8]

UNIT III

5	a)	What is grouting and write the objectives of grouting?	[7]
	b)	Explain about the mechanical stabilization, along with its affecting factors.	[8]
		(OR)	
6	a)	Describe the post grout test? What is the use of this test?	[8]
	b)	What is the principle involved in the liquefaction and also write the applications of liquefaction.	[7]

UNIT IV

7	a)	Illustrate with neat sketches the various practical applications where reinforced earth is used.	[7]
	b)	Explain the basic mechanism of reinforced Earth.	[8]
		(OR)	
8	a)	Describe the procedure of designing a reinforced earth wall.	[7]
	b)	Discuss the requirements of soil which can be used in reinforced earth wall construction.	[8]

UNIT V

9	a)	Explain various types of geosynthetics.	[7]
	b)	Explain the functions of Geotextiles in detail.	[8]
		(OR)	
10	a)	How the soil properties improve with use of geotextiles?	[7]
	b)	What design considerations should you keep in mind while using geotextiles in retaining wall?	[8]

Code No: **R194201I** **R19** **Set No. 3**

IV B.Tech II Semester Regular Examinations, April– 2023

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

*****

UNIT I

1	a)	Write the advantages of preloading methods?	[7]
	b)	Explain the impact at ground surface method of densifying granular soils.	[8]
		(OR)	
2	a)	Explain the objectives of densification in cohesion less soils	[7]
	b)	Describe the stone column techniques in ground improvement.	[8]

UNIT II

3	a)	What are the advantages and disadvantages of electro-osmosis as compared with the conventional drainage system?	[7]
	b)	Explain the multi-stage well point system	[8]
		(OR)	
4	a)	What is dewatering? List out various methods? Explain its importance in Civil engineering works.	[8]
	b)	Explain the criteria for selection of filter (filler) material around drains.	[7]

UNIT III

5	a)	Write clear on the utilization of granulated blast furnace slag in civil Engineering applications.	[7]
	b)	Differentiate between lime stabilization and cement stabilization techniques.	[8]
		(OR)	
6	a)	Write the sequences to be followed in jet grouting with neat sketch.	[7]
	b)	Explain the situations where grouting technique is adopted	[8]

UNIT IV

7	a)	Describe the external and internal stability aspects of a reinforced earth wall.	[7]
	b)	Explain the soil reinforcement interaction with neat sketches.	[8]
		(OR)	
8	a)	What are the components of a reinforced earth wall and their functions	[7]
	b)	Explain the principle of reinforced earth. List the practical case where it is used?	[8]

UNIT V

9	a)	What is a geo-membrane? Explain the functions and applications of geo-membrane.	[8]
	b)	Explain various classifications of geosynthetics in detail.	[7]
		(OR)	
10	a)	What are the different tests conducted on Geotextile materials and what properties are evaluated from these tests?	[7]
	b)	Discuss the application of geosynthetics as geomembrane for landfills and ponds.	[8]

Code No: **R194201I** **R19** **Set No. 4**

IV B.Tech II Semester Regular Examinations, April– 2023

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

*****

UNIT I

1	a)	Compare vibratory probe compaction and dynamic compaction.	[7]
	b)	With neat sketches explain in-situ densification methods in cohesive soils.	[8]
		(OR)	
2	a)	Describe vibroflotation method with neat sketches.	[7]
	b)	Explain the mechanism of stabilization using Stone Columns.	[8]

UNIT II

3	a)	Write a detail notes on sumps and interceptor ditches.	[7]
	b)	Write short notes on Dewatering by vacuum well points.	[8]
		(OR)	
4	a)	Discuss in brief about open sumps and interceptor ditches with a neat sketch.	[7]
	b)	Discuss where the electro osmosis technique is effective. Write its benefits and limitations.	[8]

UNIT III

5	a)	Explain the principle and application of soil-lime stabilization.	[7]
	b)	Explain the various types of bitumen materials used in soil stabilization.	[8]
		(OR)	
6	a)	Explain rheological properties of grout materials.	[7]
	b)	Explain the principles involved in the soil improvement by (i) jet grouting (ii) fracture grouting.	[8]

UNIT IV

7	a)	Explain the stability checks of reinforced earth walls.	[7]
	b)	What are the advantages of using reinforced earth technique?	[8]
		(OR)	
8	a)	Explain the various modes of failure of a reinforced earth walls and the methods of calculating the factors of safety against them.	[7]
	b)	How the soils nailing technique was discovered and write the importance of this technique	[8]

UNIT V

9	a)	Explain the functions and applications of Geosynthetics with the help of neat sketches.	[7]
	b)	Explain the functions of geotextile as reinforcement and separator.	[8]
		(OR)	
10	a)	List the major functions that the Geotextiles are intended to perform.	[7]
	b)	Discuss how geosynthetics control the slope failures.	[8]