Code No: **R164101B** **R16** **Set No. 1**

IV B.Tech I Semester Regular/ Supplementary Examinations, March - 2021

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1. a) List out any three methods for in situ densification of cohesive soil. [2]
   b) Write the advantages of electro-osmosis. [3]
   c) What are the various admixtures used in soil stabilization. [2]
   d) Write the principles of reinforced earth. [2]
   e) What is geogrid? How it is used in soil stabilization. [3]
   f) What are the uses of compaction grouting? [2]

PART–B *(4x14 = 56 Marks)*

2. a) Discuss the importance of stone column technique. [7]
   b) What is vertical drain? Explain the design of vertical drain. [7]

3. a) Describe with neat sketches about dewatering by sumps and ditches. [7]
   b) Write the criteria for the choice of filler material around drains. [7]

4. a) Explain the mechanical stabilization along with its factors affecting. [7]
   b) Discuss cement, lime and bitumen stabilization along with its merits and demerits. [7]

5. a) What are the stability checks in reinforced earth walls? [7]
   b) What is reinforced earth? What are the components involved in it. [7]

6. a) Write the functions and properties of geo textiles. [7]
   b) What are the different types of Geo-synthetics? Explain. [7]

7. a) What is grouting? Discuss the objectives of grouting. [7]
   b) Discuss the hydraulic fracturing in soils and rocks. [7]

Code No: **R164101B** **R16** **Set No. 2**

IV B.Tech I Semester Regular/ Supplementary Examinations, March - 2021

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
*****

PART–A *(14 Marks)*

1.	a)	What do you understand by preloading?	[2]
	b)	What are various methods of dewatering?	[3]
	c)	Write the importance of fly ash in soil engineering.	[2]
	d)	List out the components of soil nailing?	[2]
	e)	Discuss regarding geotextiles as separators.	[3]
	f)	List out the objectives of grouting.	[2]

PART–B *(4x14 = 56 Marks)*

2.	a)	Explain sand drains with a neat sketch.	[7]
	b)	Explain the vibroflotation technique of densifying granular soil.	[7]
3.	a)	Explain the principle of electro-osmosis method of dewatering.	[7]
	b)	Explain single and multistage well point system of dewatering.	[7]
4.	a)	What are the factors affect the mechanical stability of a mixed soil?	[7]
	b)	Explain the principle and application of soil-lime stabilization.	[7]
5.	a)	Explain about the mechanism involved in soil nailing with a neat sketch.	[7]
	b)	Explain the design principles of reinforced earth walls	[7]
6.	a)	Write the functions and applications of geo grids.	[7]
	b)	Discuss the applications of geo-membranes and gabions.	[7]
7.	a)	List out the grouts and write their applications.	[5]
	b)	Explain in detail the post grout tests.	[9]

Code No: **R164101B** **R16** **Set No. 3**

IV B.Tech I Semester Regular/ Supplementary Examinations, March - 2021

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
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PART–A *(14 Marks)*

1. a) Write the sand columns installation procedure. [2]
   b) Discuss about dewatering. [3]
   c) Write the benefits of the soil in stabilizing with cement. [2]
   d) Write the properties of soil preferred for reinforced earth wall construction. [2]
   e) Write any four major applications of geotextiles. [3]
   f) What is the primary difference in single, double and triple fluid jet grouting? [2]

PART–B *(4x14 = 56 Marks)*

2. a) Describe in detail the advantage of using vertical drains along with preloading. [7]
   b) With neat sketch explain in situ densification methods in cohesive soil. [7]

3. a) Explain in detail the vacuum well point system of dewatering. [7]
   b) Discuss in brief about open sumps and inspector ditches with a neat sketch. [7]

4. a) Explain how the engineering properties of soil are changed by the process of bituminous stabilization. [7]
   b) Discuss the applicability of industrial wastes in soil stabilization. [7]

5. a) Discuss about the soil nailing. [7]
   b) What do you understand by reinforced earth? Write the various applications of reinforced earth. [7]

6. a) Discuss about geogrids and gabions. [7]
   b) Explain with clear illustrations, the principle involved in geotextile materials reinforcement for improving the bearing capacity of soil. [7]

7. a) Describe briefly different grouting techniques. [7]
   b) Explain in detail with the help of a neat sketch the different stages of grouting. [7]

Code No: **R164101B** **R16** **Set No. 4**

IV B.Tech I Semester Regular/Supplementary Examinations, March - 2021

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
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PART–A *(14 Marks)*

1. a) How can you identify that a soil is soft. [2]
   b) What are the criteria for the choice of filler material? [3]
   c) Write the effectiveness of bitumen in soil stabilization. [2]
   d) What are the uses of soil reinforcement? [2]
   e) What are the types of geo-textiles? [3]
   f) What are the factors that influence the grout requirement? [2]

PART–B *(4x14 = 56 Marks)*

2. a) Explain the advantages of geo drains when compared with sand drains. [7]
   b) List the objectives of compaction of soil and explain the purpose of compaction. [7]

3. a) Discuss where the electro osmosis technique is effective. Write its benefits and limitations. [7]
   b) Discuss with neat sketches the following pre-drainage methods: (i) Well points and (ii) Vacuum wells. [7]

4. a) What are the various admixtures used in stabilization of soil? Describe in detail the engineering benefits of lime modification of soils. [7]
   b) Describe the various types of bitumen materials used in soil stabilization. [7]

5. a) Describe the procedure of soil nailing. [7]
   b) What are the factors governing the design of reinforced earth walls? [7]

6. a) Explain the properties and applications of geotextiles. [7]
   b) Explain in detail the use of geosynthetics as reinforcement. [7]

7. a) Briefly explain about various type of grouts used in ground improvements. [7]
   b) What is post grout test? Discuss how it is performed. [7]