Code No: **RT41016** **R13** **Set No. 1**

IV B.Tech I Semester Regular/Supplementary Examinations, Oct/Nov - 2018

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 THREE questions from Part-B
*****

PART–A *(22 Marks)*

1. a) How do you identify a soil is soft? Write a note. [3]
   b) What is electro osmosis? [3]
   c) List various admixtures used in soil stabilization. [4]
   d) Write the principle of soil reinforcement with neat illustrations. [4]
   e) Write the benefits of geosynthetics in landfill construction. [4]
   f) Write a note on importance of grain size analysis of soil in selection of grouting method. [4]

PART–B *(3x16 = 48 Marks)*

2. a) List the objectives of compacting soil and explain the purpose of compaction. [8]
   b) What is Dynamic Compaction? Discuss how it is carried out. Also write its benefits and limitations. [8]

3. a) Discuss with neat sketches the following pre-drainage methods:
   (i) Well points and (ii) Vacuum wells. [8]
   b) Discuss any two selection criteria of filler material around drains. [8]

4. a) Discuss the mechanisms of Bituminous Stabilization of in-situ soils. And also write the factors affecting bituminous Stabilization of soils. [8]
   b) Discuss the design mixture and construction techniques of Bituminous Stabilization. [8]

5. a) Explain the principle involved in the reinforced earth. [8]
   b) Describe the external and internal stability aspects of a reinforced earth wall. [8]

6. a) What are clay liners? Discuss the purpose of clay liners. [8]
   b) Discuss the effectiveness of geosynthetics used in filtration and erosion control purposes. [8]

7. a) Why grouting is important in soil engineering? Explain in detail the methods of grouting. [8]
   b) Discuss the process of soil improvement by suspension and solution grouting. [8]

Code No: **RT41016** **R13** **Set No. 2**

IV B.Tech I Semester Regular/Supplementary Examinations, Oct/Nov - 2018

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 THREE questions from Part-B
*****

PART–A *(22 Marks)*

1. a) How do you identify a soil is dense? Write a note. [3]
   b) Discuss about sumps and interceptor ditches. [3]
   c) What is fly ash? List its importance in soil engineering. [4]
   d) Write the uses of soil reinforcement. [4]
   e) Write the uses of geocell in road construction. [4]
   f) Write the uses of compaction grouting. [4]

PART–B *(3x16 = 48 Marks)*

2. a) List the objectives of compaction of soil and explain the purpose of compaction. [8]
   b) Discuss any two methods with suitable illustrations to improve the loose sand deposits which have SPT N value in the range of 4 to 6 for a depth of 20 m from the ground surface. [8]

3. a) Explain the criteria for selection of fill material around drains. [8]
   b) With neat sketch explain the dewatering by electro osmosis. [8]

4. a) What are the principles in the soft aggregate stabilization technique? Explain with clear illustrations. [8]
   b) Briefly discuss about Bitumen and polymer stabilization. [8]

5. a) Explain any four engineering application of reinforced earth with sketches. [8]
   b) Design a reinforced earth wall for retaining a 6 m high cohesionless soil. The soil in the wall and backfill has density of 18 kN/m^3 with angle of internal friction of 35 degrees. The allowable soil pressure is 150 kN/m^2. Use galvanized strips as reinforcement. [8]

6. a) Describe the different forms of Geogrids and state their functions in the stabilization of soils. [8]
   b) Explain how Geotextiles can be used as separators. [8]

7. a) Defining grouting, discuss various fields of applications of grouting in soil engineering. [8]
   b) Explain the principles involved in the soil improvement by (i) compaction grouting (ii) jet grouting and (iii) fracture grouting. [8]

Code No: **RT41016** **R13** **Set No. 3**

IV B.Tech I Semester Regular/Supplementary Examinations, Oct/Nov - 2018

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 THREE questions from Part-B
*****

PART–A *(22 Marks)*

1. a) How do you identify a soft clay? Write a note on it. [3]
   b) Write note on horizontal wells. [3]
   c) When do we stabilize a soil with cement? Write the benefits. [4]
   d) Draw the neat sketch showing various elements of reinforced earth wall. [4]
   e) List any four functions of geosynthetics. [4]
   f) Write the advantages of grouting of soil. [4]

PART–B *(3x16 = 48 Marks)*

2. a) What are the in situ conditions of soils which seek ground improvement? Write the objectives of ground improvement. [8]
   b) Discuss the following ground improvement methods with clear mechanisms: (i) stone columns (ii) lime columns. [8]

3. a) Explain about single and multi stage well points. [8]
   b) Discuss where the electro osmosis technique is effective. Write its benefits and limitations. [8]

4. a) Why soils are to be stabilized? Discuss the principles of soil - fly ash stabilization and associated benefits. [8]
   b) Discuss how effective is calcium chloride in stabilization of swelling soils. [8]

5. a) Explain the design principles of reinforced earth walls [8]
   b) Discuss about the soil nailing. [8]

6. a) Discuss the application of geosynthetics as geomembrane for landfills and ponds. [8]
   b) Why slope stability is required to analyze? Discuss how geosynthetics control the slope failures. [8]

7. a) Explain any three engineering applications of grouting which proves to be effective? [8]
   b) Describe in detail the grouting with ‘soil-cement mixes’, ‘cement’, and ‘lime’ grouts. [8]

Code No: **RT41016** **R13** **Set No. 4**

IV B.Tech I Semester Regular/Supplementary Examinations, Oct/Nov - 2018

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 THREE questions from Part-B
*****

PART–A *(22 Marks)*

1. a) List the shallow compaction techniques of soil modification. [3]
   b) Write the objectives of dewatering of soil. [3]
   c) Differentiate ground improvement by admixtures and densification methods. [4]
   d) Write the properties of soil preferred for reinforced earth wall construction [4]
   e) Write any four uses of geosynthetics in civil engineering. [4]
   f) Write the objectives of grouting. [4]

PART–B *(3x16 = 48 Marks)*

2. a) Explain the terms Vibro-Compaction and Vibro-Replacement, highlighting the typical characteristics and the relative effectiveness of both the terms. [8]
   b) Discuss the benefits and limitations of blasting method of soil densification. [8]

3. a) What is the principle involved in electro-osmosis? Explain. [8]
   b) Describe with neat sketches the vacuum well point system of dewatering of soft clays. [8]

4. a) What are the various admixtures used in stabilization of soil? Describe in detail the engineering benefits of lime modification of soils. [8]
   b) Discuss with suitable reasons the benefits that are derived by stabilising the soil with granulated blast furnace slag. [8]

5. a) What is reinforced earth? What are the components involved in it. [8]
   b) What are the stability checks in reinforced earth walls? [8]

6. a) What are the different tests conducted on Geotextile materials and what properties are evaluated from these tests. [8]
   b) List the major functions that the Geotextiles are intended to perform. [8]

7. a) Describe different grouting techniques depending upon the stabiliser used? Also write their suitability for different soils. [8]
   b) What is post grout test? Discuss how it is performed. [8]