Code No: **R41016** **R10** **Set No. 1**

IV B.Tech I Semester Regular/Supplementary Examinations, Nov/Dec - 2015

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

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

Answer any FIVE Questions

All Questions carry equal marks

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1 a) Explain the need and suitability of the ground improvement technique for different types of soils. [8]

b) Write short notes on foundation drains and blanket drains with neat sketches. [7]

2 a) List out four physical characteristics of grouting liquid relevant to engineering applications. [8]

b) Differentiate between the compaction grouting and displacement grouting. [7]

3 a) Describe the method of densification by Blasting? Explain its effectiveness. [8]

b) Explain the objectives of densification in cohesionless soils. [7]

4 a) Describe theory related lime columns. [8]

b) Write short notes on different drains related to their advantages and disadvantages. [7]

5 a) Explain the design procedure of soil-lime stabilization [8]

b) Write short notes on how the engineering properties of soils are modified by bituminous stabilization. [7]

6 Explain the principle behind the soil reinforcement. What are the components of a reinforced earth wall and their functions? Describe the construction of a reinforced earth wall with the help of neat sketches for different stages. [15]

7 a) List out the applications of Geotextiles based on separation and reinforcement functions. [8]

b) Describe the different forms of Geogrids and state their functions in the stabilization of soils [7]

8 a) Write a note on tests for identification of expansive soils. [8]

b) What are the various problems that are encountered for foundations constructed on expansive soils? [7]

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Code No: **R41016** **R10** **Set No. 2**

IV B.Tech I Semester Regular/Supplementary Examinations, Nov/Dec - 2015

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

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

Answer any FIVE Questions

All Questions carry equal marks

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1 a) Explain the criterion for the selection of filling material [8]

b) Write note on vacuum dewatering technique for densification of cohesive soils. [7]

2 a) What aspects would you consider in deciding on the spacing and depth of injection holes for a grout curtain below a dam? [8]

b) Explain briefly ascending, descending and stage grouting hydraulic fracturing in soils and rocks. [7]

3 a) Explain the terms Vibro-Compaction and Vibro-Replacement, highlighting the typical characteristics and the relative effectiveness of both the terms. [8]

b) Briefly explain the impact at the ground surface method of densification and also list out its merits and demerits. [7]

4 a) Explain the construction procedure of stone columns. [8]

b) Discuss about the importance of preloading with vertical drains on comparing the method of preloading without vertical drains. [7]

5 a) What is the principle behind the soil stabilization with sodium silicate? [8]

b) Write short notes on suitability and application of lime stabilization. [7]

6 a) What is reinforced earth? How does it differ in action from reinforced cement concrete? [8]

b) Explain the design considerations involved in reinforced earth retaining walls. [7]

7 a) Explain the advantages and disadvantages of woven and non-woven geotextiles [8]

b) Explain the various tests conducted on geotextiles to assess their properties [7]

8 a) What are the factors influencing the swelling behavior of soil? [8]

b) Explain briefly various methods that are to be used to improve the expansive soils for foundations. [7]

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Code No: **R41016** **R10** **Set No. 3**

IV B.Tech I Semester Regular/Supplementary Examinations, Nov/Dec - 2015

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks
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1 a) Explain how electro osmosis technique is effective in improving the behavior of expansive soils. [8]
b) Write note on the multi-stage well point system of dewatering. [7]

2 a) What is the role of grouting in ground improvement? Distinguish between suspension grouts and solution grout. [8]
b) Describe the post grout test? What is the use of this test? [7]

3 a) Describe the impact at depth densification method for granular soils. Explain its effectiveness. [8]
b) A sand deposit exists in a very dense state. What will be the influence of in situ densification technique on the density of such a deposit? Explain briefly. [7]

4 a) What site conditions stone columns are preferred? If the soil is very soft clay would you recommend the stone column methods? [8]
b) Explain the preloading method with neat sketch. And also list out its advantages and disadvantages. [7]

5 a) Describe any one method of chemical stabilization and list out the advantages and disadvantages of the method. [8]
b) Explain the different applications of mechanical stabilization. [7]

6 a) What are the components in reinforced earth? Illustrate with neat sketches the various practical applications where reinforced earth is used. [8]
b) How can the horizontal spacing of reinforcing strips be derived for the material in a retaining wall. [7]

7 a) Describe the functions and applications of geogrids. [8]
b) Explain how geotextiles are used in slope stabilization and in embankment construction in soft soils. [7]

8 a) What is Cohesive-Non Swelling layer? When do you use it and what are its limitations? [8]
b) Discuss the principle and functioning of under-reamed piles. [7]

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Code No: **R41016** **R10** **Set No. 4**

IV B.Tech I Semester Regular/Supplementary Examinations, Nov/Dec - 2015

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks
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1 a) What is dewatering? What are the objectives of dewatering? [8]
b) What is the Principle behind the Electro-osmosis method of dewatering? Explain in detail about the Electro-Osmosis theory with neat sketches. [7]

2 a) What are the different types of Grouts available and what are its properties? [8]
b) Write the sequences to be followed in jet grouting with neat sketch. [7]

3 a) What are the different in-situ densification methods available for granular soils? [8]
b) List the factors that have to be considered while selecting an in situ densification technique for loose sand. [7]

4 a) Explain the ground modification by thermal method. [8]
b) Explain the principle behind the ground modification with lime columns? Explain the advantages and disadvantages of this method. [7]

5 a) Describe soil-cement stabilization. What are the actions involved in soil – cement stabilization? Explain what are the factors affecting strength of soil-cement mixes? [8]
b) Enumerate the use of industrial wastes with respect to soil stabilization. [7]

6 a) Explain the advantages and disadvantages of reinforced earth walls over the traditional retaining walls. [8]
b) Explain the various modes of failure of a reinforced earth walls and the methods of calculating the factors of safety against them. [7]

7 a) What is a Geogrid? Explain its functions and applications. [8]
b) Distinguish between "Drainage" and "Filtration" function of Geotextiles. Give applications based on each function. [7]

8 a) Why the soils become expansive soils? What are the typical range of values of Atterberg limits, percentage of clay fraction and colloid content? [8]
b) What are the measures to be taken to prevent the swelling of expansive soils? [7]

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