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B.Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 (a) How dewatering methods improve the strength characteristics of a soil? Explain in detail.

(b) Explain the electro-osmosis method of dewatering soil.

2 (a) What do you understand by grouting? What are the objectives of grouting? Briefly discuss about various grouts and their properties.

(b) Explain clearly about ascending, descending and stage grouting techniques.

3 (a) What factors influence the compaction of granular soils? Explain.

(b) Explain the method of vibro flotation applied for compaction of granular soils at depth. Give neat sketches wherever required.

4 (a) Listing out different vertical drains that can be used in saturated cohesive soils, explain the use of vertical drains in the densification of fine grained soils.

(b) For achieving the required densification and strength in a cohesive soil, how lime and stone columns can be used? Explain.

5 What are the principles to be followed in soil stabilization? Explain about soil-cement stabilization and also the factors influencing the strength of soil-cement mixes.

6 (a) Give the applications of reinforced earth in civil engineering and the principles governing reinforced earth.

(b) Explain the design principles of reinforced earth walls and factors governing their design.

7 What are geosynthetic materials and what are their types? Explain. Also discuss the functions and applications of geo-grids and geo-membranes in ground improvement.

8 (a) Why expansive soils are considered as problematic soils? Explain. Also discuss about tests for identification of expansive soils.

(b) Explain the use of underreamed piles in expansive soils. Support your answer with a neat sketch.

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B.Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 (a) Explain the methods of single stage and multi stage well points for draining of water from soils.

(b) What is the criteria normally employed for selection of fill material around drains? Explain. Also briefly discuss about blanket drains.

2 Explain why grouting is required to improve the strength of a soil. Also briefly discuss about various grouting techniques employed in ground improvement.

3 (a) Why in-situ densification is needed in case of granular soils? Clearly explain.

(b) Discuss about the use of vibration method and impact method for compacting granular soils at depth.

4 (a) Explain how in-situ densification of cohesive soils can be achieved by using vertical drains.

(b) Discuss the use and application of sand drains, sand wicks and geodrains in the densification of fine grained soils.

5 (a) What are the methods of soil stabilization available? What are the principles to be followed in soil stabilization? Explain.

(b) Describe the various steps involved in soil-lime stabilization process.

6 (a) Give the applications of reinforced earth in civil engineering and the principles governing reinforced earth.

(b) Explain the design principles of reinforced earth walls and the factors influencing their design.

7 (a) What are geotextiles? What are the advantages of using geotextiles for drainage compared to other methods? Explain.

(b) Describe the different types of geogrids and their functions in improving the soil strength.

8 Write short notes on the following:

(a) Problems with expansive soils.

(b) Swell pressure determination.

(c) Underreamed piles.

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B.Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 What is the need for dewatering the soil and in what way the dewatering process improves the strength characteristics of a soil? Explain. Discuss about foundation drains and blanket drains as dewatering measures.

2 (a) Explain the need for grouting and also give examples for the field application of grouting.
(b) Describe the equipment used in various methods of grouting.

3 (a) Describe the application of vibration and impact for in-situ densification of granular soils at large depths.
(b) Discuss about the use of vibro flotation technique for densification of granular soils.

4 (a) What is the need for densification of cohesive soils? Explain how preloading technique can be used for this purpose.
(b) Explain the use of stone and lime columns for densification of cohesive soils.

5 (a) Discuss the principles to be followed and also the process of soil-bitumen stabilization.
(b) Explain the role of chemicals like calcium chloride, sodium silicate and gypsum in the process of soil stabilization.

6 (a) What are the principles involved in reinforced earth? What are the components of reinforced earth? Explain.
(b) What factors govern the design of reinforced earth walls? Explain. Also give the applications of reinforced earth walls in civil engineering structures.

7 Explain about the types and function of geotextiles, geogrids and geomembranes. Also explain their use in improving the soil strength.

8 (a) Explain the methodology adopted to determine the swell pressure of expansive soils.
(b) What are the various remedial measures used in designing the foundations in expansive soils.

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B.Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 (a) Explain how single stage wells and multi stage wells can be used for dewatering soils.

(b) Write in detail about electro-osmosis method of dewatering of soils.

2 (a) What is grouting? What are the objectives of grouting? Discuss.

(b) Explain about ascending, descending and stage grouting techniques.

3 Explain the need and importance on in-situ densification of granular soils. Also explain the use of vibration and compaction methods for densification of soils.

4 (a) Explain the use of preloading method for densification of cohesive soils. Support your answer with neat sketches wherever needed.

(b) Discuss about the used and application of sand drains in densification of cohesive soils.

5 (a) What are the principles and guidelines for mechanical stabilization of soil? Explain.

(b) Discus about the methods of stabilizing the soils using chemical compounds.

6 (a) What are the design principles of reinforced earth walls? What are the factors governing the design of such walls? Explain.

(b) Explain the components of reinforced earth and the applications of reinforced earth in civil engineering.

7 Explain about the types and functions of geotextiles, geogrids and geomembranes. Also discuss the application of these materials for improving soil strength.

8 (a) Why expansive soils are considered as problematic soils? What are the tests used for identification of such soils? Explain.

(b) Discuss about techniques for improving the strength characteristics of expansive soils.

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