

**BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT**

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code 

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Sixth Semester B.E. Degree Examinations, September/October 2024

**GROUND IMPROVEMENT TECHNIQUES**

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions choosing ONE full Question from each Module.  
2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PI)</u>
<b>Module-1</b>			
1.	a. What are reclaimed soils? Explain the materials used for reclamation.	06	(2:1:1.2.1)
	b. Explain briefly the various soil deposits in India.	06	(2:1:1.2.1)
	c. What are the reasons for alterations of ground after formation?	08	(2:1:1.2.1)
<b>OR</b>			
2.	a. Explain the factors affecting the compaction of soil.	06	(2:1:1.2.1)
	b. Explain briefly the dynamic compaction.	06	(2:1:1.2.1)
	c. Describe the typical field procedure for compacting soil in a construction project.	08	(2:1:1.2.1)
<b>Module-2</b>			
3.	a. Discuss the various techniques used for groundwater and seepage control.	06	(2:2:1.2.1)
	b. Describe the design criteria for filters in drainage systems.	06	(2:2:1.2.1)
	c. Explain with neat sketch single stage and multistage well point system of dewatering.	08	(2:2:1.2.1)
<b>OR</b>			
4.	a. What are surface and subsurface drains?	06	(2:2:1.2.1)
	b. Describe the process of pre-compression and its importance in soil improvement.	06	(2:2:1.2.1)
	c. What is electro-kinetic dewatering? Discuss its advantages and typical applications in soil stabilization.	08	(2:2:1.2.1)
<b>Module-3</b>			
5.	a. How does the hydration of cement affect the permeability and swelling characteristics of stabilized soil?	06	(2:3:1.2.1)
	b. Explain the use of fly ash in soil stabilization.	06	(2:3:1.2.1)
	c. What are the key criteria for selecting cement stabilization in a construction project?	08	(2:3:1.2.1)
<b>OR</b>			
6.	a. Briefly describe the process and criteria for "lime stabilization".	06	(2:3:1.2.1)
	b. Describe in detail how chemicals are used in stabilizing the soil with the help of an example.	06	(2:3:1.2.1)
	c. Explain the Tar and bitumen stabilization.	08	(2:3:1.2.1)

#### Module-4

7. a. What is vibro compaction? Discuss its process and typical applications in soil improvement. 06 (2:4:1.2.1)  
b. What are sand compaction piles, and how do they improve soil stability? 06 (2:4:1.2.1)  
c. Explain the vibro flotation technique in detail. How does it improve soil properties, and what are its common applications? 08 (2:4:1.2.1)

OR

8. a. What are the primary effects of grouting on soil or rock formations? 06 (2:4:1.2.1)  
b. Describe the types of materials used in chemical grouting. How do chemical grouts differ from cement-based grouts? 06 (2:4:1.2.1)  
c. With a neat sketch, describe the grouting procedure. 08 (2:4:1.2.1)

#### Module-5

9. a. What are geotextiles, and how are they used in civil engineering applications. 06 (3:5:1.2.1)  
b. Discuss the mechanical properties of geo-synthetics that are critical for their performance in reinforcement applications. 06 (3:5:1.2.1)  
c. Describe following two major applications of geo-synthetics with neat sketches: 08 (3:5:1.2.1)  
(i) Filtration (ii) Reinforcement

OR

- 10 a. Write a short note on: 20 (3:5:1.2.1)  
(i) Gabions -Mattresses (ii) Rock bolts  
(iii) Stone column (iv) Anchors

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