

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIRST SEMESTER M.TECH DEGREE EXAMINATION (R), DECEMBER 2023**GEOMECHANICS AND STRUCTURES****(2021 Scheme)****Course Code: 21GS105-B****Course Name: Ground Improvement Techniques****Max. Marks: 60****Duration: 3 Hours****PART A*****(Answer all questions. Each question carries 3 marks)***

1. Explain vacuum preloading.
2. Discuss the application of grouting while performing tunneling operations.
3. Elaborate the mechanism of lime stabilization.
4. If a reinforcement in the form of a metal strip is placed in an embankment of granular soil, what are the different modes by which they can fail?
5. Describe soil fracturing and comment on the applications.
6. Explain microbial ground improvement.
7. Discuss the different functions of geosynthetics.
8. Enumerate the different types of geosynthetics.

PART B***(Answer one full question from each module, each question carries 6 marks)*****MODULE I**

9. With necessary sketches, explain the process of vibro-floatation. (6)

OR

10. Explain the design principles and the estimation of load carrying capacity of a stone column. (6)

MODULE II

11. Describe the process of jet grouting and its applications with sketches. (6)

OR

12. Differentiate one shot and two shot system of grout injection with necessary sketches. (6)

MODULE III

13. What are lime columns? Describe the principles of lime columns. (6)

OR

14. Explain the process of bituminous stabilization and its mechanism. (6)

MODULE IV

15. With neat sketches, explain the mechanism of:
- a. Reinforcement beneath a foundation improving the bearing capacity. (6)
 - b. Base layer and sub-grade layer interaction in flexible pavement.

OR

16. What are ground anchors? Explain the uplift capacity of a ground anchor. (6)

MODULE V

17. Explain in-situ soil mixing by dry method deep mixing. (6)

OR

18. Describe the different nano-technological ground improvement methods. (6)

MODULE VI

19. Explain the different tests for quality assurance of geosynthetics. (6)

OR

20. Describe the uses of geosynthetics in following cases: (6)
- a. Canal lining
 - b. Slope stabilization
