

GROUND IMPROVEMENT TECHNIQUES

(Transportation Engineering)

Time: 3 Hours

Max Marks: 60

Answer any FIVE questions

All questions carry EQUAL marks

- 1 a What is the necessity and objective of ground improvement? Classify the ground improvement techniques.
 b Explain the suitability of the ground improvement technique for different soils.
- 2 a Explain with neat sketches mechanism and principle of Dynamic Compaction Techniques
 b What is a “Sand Drain”? How is it constructed and is useful in densifying cohesive soil deposits? Explain Drain Resistance and Smear effect in relation to the drain.
- 3 a Describe with neat sketches about the dewatering by vacuum well points. What are the advantages and disadvantages of this system?
 b What is the Principle behind the Electro-osmosis method of dewatering? Explain in detail about the Electro-Osmosis theory with neat sketches.
- 4 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?
 b Explain the different applications of mechanical stabilization
- 5 a Explain the basic mechanism of reinforced Earth.
 b 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.
- 6 a What are the different types of Grouts available and what are its properties?
 b List out four physical characteristics of grouting liquid relevant to engineering applications.
- 7 a Explain the construction procedure of stone columns?
 b In what site conditions stone columns are preferred? If the soil is very soft clay would you recommend the stone column methods?
- 8 Write short notes on
 - a. Soil Confinement Systems
 - b. Cofferdams
 - c. Stabilization with calcium chloride