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**Question Paper Code : 21185**

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Seventh Semester

Civil Engineering

CE 2033/CE 708 – GROUND IMPROVEMENT TECHNIQUES

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the necessity of ground improvement?
2. List out the methods of ground improvement.
3. How the dewatering is carried out for the construction of bored tunnel.
4. Enumerate the problems occurred due to seepage of water.
5. Differentiate between sand drains and stone columns.
6. Write short notes on dynamic compaction.
7. What do you mean by reinforced soil?
8. Discuss the reinforcement of soil beneath foundation.
9. What are various application of grouting?
10. Discuss the basic function of grouting.

PART B — (5 × 16 = 80 marks)

11. (a) (i) What are the factors to be considered in the selection of best technique for the ground Improvement? (8)
- (ii) Discuss the various methods of ground improvement for alluvial and laterite soil. (8)

Or

- (b) (i) How the performance of black cotton soil can be improved. Discuss. (10)
- (ii) Describe a method suitable to stabilize a highway fill foundation in hilly terrain with high rain fall. (6)

12. (a) (i) What are dewatering methods available for the fine grained soils? Explain any two. (10)  
(ii) Explain the properties and application of flow net. (6)

Or

- (b) (i) Discuss the uses of single stage well point installation. (6)  
(ii) How the dewatering is carried out during excavation? Discuss. (10)

13. (a) (i) Explain the insitu densification of cohesionless soil. (10)  
(ii) Discuss the vibroflotation technique for clay soil. (6)

Or

- (b) (i) Describe dynamic consolidation. (6)  
(ii) Write short notes on lime pile and sand pile. (4)  
(iii) Compare the relative merits of various methods of insitu treatment of cohesive and cohesionless soils. (6)

14. (a) (i) Discuss the application of soil reinforcement in the Civil Engineering construction with neat sketches. (6)  
(ii) Explain the construction sequence of a reinforced earth wall with vertical faces. (10)

Or

- (b) (i) Describe the uses of geo textiles and geo membranes in the road works. (6)  
(ii) Explain the soil reinforcement interaction with neat sketches. (10)

15. (a) (i) Describe the desirable characteristics of grouting. (8)  
(ii) List out the grouting methods and discuss any two in detail. (8)

Or

- (i) Write the sequence to be followed in jet grouting with neat sketch. (8)  
(ii) Compare the relative advantages and disadvantages of permeation grouting using cement grout and chemical grout. (8)