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**Question Paper Code : X10216**

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2021  
Sixth Semester  
Civil Engineering  
CE 8001 – GROUND IMPROVEMENT TECHNIQUES  
(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. State at least four reasons to adopt ground improvement techniques.
2. What are the problems associated with soft clay deposits ?
3. What are the limitations of open sump and ditches methods used for dewatering work ?
4. Define dewatering and the need for dewatering.
5. Draw a cross section of fabric drain and highlight the function of each part.
6. Write at least two merits and demerits each of dynamic compaction.
7. Define geosynthetics.
8. What is called reinforced soil ?
9. What is Grouting ?
10. Write at least four purpose of grouting.

PART – B

(5×13=65 Marks)

11. a) Discuss in details the various factors that needs to be considered in the selection of best ground improvement technique. (13)

(OR)

- b) Discuss the geotechnical problems associated with black cotton, alluvial and lateritic soil and briefly discuss methods to improve these soils.

(5+4+4)

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12. a) Explain in detail the well point system of dewatering. **(13)**  
(OR)
- b) i) Explain vacuum and electro osmosis method of dewatering for ground improvements. **(4+4)**  
ii) Explain the properties and application of flow net. **(3+2)**
13. a) How is a stone column installed by Vibro-displacement method ? Explain in detail. **(13)**  
(OR)
- b) Explain in detail pre-loading method of ground improvement. How do vertical drains improve the functioning of pre-loading technique ? **(13)**
14. a) Explain the construction sequence of a reinforced earth wall with vertical faces. With neat sketches, briefly explain the various applications of reinforced earth for ground improvement. **(6+7)**  
(OR)
- b) What are Geotextiles ? Explain in detail about the applications of geotextiles in road separation, filtration and drainage. **(2+4+4+3)**
15. a) i) Explain compaction grouting in detail. Write various advantages and disadvantages of this type grout method. **(7)**  
ii) Briefly discuss two different types of grouting materials used in ground treatment work. **(3+3)**  
(OR)
- b) Explain in detail about stabilisation of soil using cement, lime and chemicals. **(5+4+4)**

PART – C

**(1×15=15 Marks)**

16. a) Compare and contrast different features of (i) dynamic compaction (ii) vibroflotation (iii) lime piles and (iv) shallow compaction.  
(OR)
- b) Discuss the various steps involved in the design of dewatering system to control ground water during any civil engineering construction.
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