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Reg. No. :

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Question Paper Code: 59113

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Elective

Civil Engineering

15UCE913- GROUND IMPROVEMENT TECHNIQUES

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The process of removal of water from the soil is known as CO1- R
(a) blasting (b) stabilization (c) preloading (d) dewatering
2. _____ system is suitable for lowering the ground water CO1- R
table where the soil formation is pervious with depth.
(a) consolidation (b) preloading (c) deep well drainage (d) blasting
3. The compaction is measured quantitatively in terms of CO2- R
(a) voids ratio (b) porosity (c) dry density (d) specific gravity
4. Vibro-flotation is an efficient technique for densifying _____ CO2- R
soils.
(a) coarse sand (b) granular sand (c) cohesive (d) cohesionless
5. The vertical drains are continuous vertical columns of _____ CO3- R
material installed in clayey soils.
(a) bitumen (b) stone (c) Sand (d) clay
6. The recompression is about Of the compaction index. CO3- R
(a) 5 times (b) 1/5 (c) 1/2 (d) 1/20

7. The part of consolidation which is completely controlled by the resistance to flow of water under the induced hydraulic gradient is known as _____ consolidation CO4- R
 (a) primary (b) tertiary (c) secondary (d) quaternary
8. The dolomite quick lime is given by _____ CO4- R
 (a) CaO + AgO (b) Na₂O + MgO (c) CaO + MgO₂ (d) CaO + MgO
9. If Grout is injected into the soil at low pressure and voids are filled, then it is..... CO5- R
 (a) Jet grouting (b) Compaction grouting
 (c) Permeation grouting (d) Cement grouting
10. The situation in which the grout flows freely with minimal effect into the soil voids or rock seams is known as _____ CO5- R
 (a) consolidation (b) displacement (c) permeation (d) compaction

PART – B (5 x 2= 10Marks)

11. What is the necessity of ground improvement? CO1- R
12. Define the term vipro-compactions. CO2- R
13. What is meant by primary and secondary consolidations. CO3- R
14. Quote the significance of soil stabilization. CO4- R
15. Mention the importance of hydraulic fracturing. CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Explain the following methods of dewatering systems of drainage methods. CO1- U (16)
 1. Open sumps and ditches
 2. Well point systems
 Or
- (b) Describe the dewatering by electro osmosis method with suitable sketches. CO1- U (16)
17. (a) What is meant by vibroflotation? How it is executed in field? CO2- U (16)
 Or
- (b) Explain how surface compaction technique is useful in improving the properties of the soil.. CO2- U (16)

18. (a) Explain in detail about the methods of pre-loading techniques. CO3- U (16)
Or
(b) Define Vertical drain. Discuss the principle and design of vertical drain. CO3- U (16)
19. (a) Discuss about the mechanical stabilization and its significances. CO4- U (16)
Or
(b) Describe about the chemical stabilization and bituminous stabilization. CO4- R (16)
20. (a) Explain about the various types of geo synthetics and its properties and application in ground improvement. CO5- Ana (16)
Or
(b) Describe in detail about the various methods of grouting with neat diagram. CO5- U (16)

