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Question Paper Code: 54113

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

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 table where the soil formation is pervious with depth. CO1- R
(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 _____ soils. CO2- R
(a) coarse sand (b) granular sand (c) cohesive (d) cohesionless
5. A change in the stress system acting on a soil mass causes a change in the volume of the soil mass is known as CO3- R
(a) permeability (b) stability (c) compatibility (d) compressibility

6. The vertical drains are continuous vertical columns of _____ material installed in clayey soils. CO3- R
- (a) bitumen (b) stone (c) Sand (d) clay
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) $\text{CaO} + \text{AgO}$ (b) $\text{Na}_2\text{O} + \text{MgO}$ (c) $\text{CaO} + \text{MgO}_2$ (d) $\text{CaO} + \text{MgO}$
9. 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
10. The process of ground improvement attained by injecting fluid like material into subsurface soil or rock is known as _____ CO5- R
- (a) electro osmosis (b) grouting (c) surcharge fills (d) tamping

PART – B (5 x 2= 10Marks)

11. What is the necessity of ground improvement? CO1- R
12. Define the term vibro-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) Elaborate the smooth wheel roller method, sheep foot roller and grid roller processes of surface compaction. CO2- U (16)
- Or
- (b) Discuss the process of blasting of the vibro-compaction method with suitable sketch. CO2- U (16)
18. (a) Explain about the compressibility characteristics of any six types of soil deposits. CO3- U (16)
- Or
- (b) What is meant by preloading? Describe about the various preloading CO3- U (16)
19. (a) Discuss about the mechanical stabilization and its significances. CO4- Ana (16)
- Or
- (b) Describe about the chemical stabilization and bituminous stabilization. CO4- R (16)
20. (a) Critically discuss about the suspensions grouts and grouting with cement mixes. CO5- Ana (16)
- Or
- (b) Explain about the various types of geo synthetics and its properties and application in ground improvement. CO5- U (16)

