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**Reg. No. :**

**Question Paper Code: 49013**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Elective

Civil Engineering

14UCE910 – GROUND IMPROVEMENT TECHNIQUE

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The process of increasing density of soil by means of suitable device is known as

(a) Vibration (b) Compaction (c) Grouting (d) Soil stabilization

2. \_\_\_\_\_\_ are soils that expand when water is added, and shrink when they dry out.

(a) Liquefiable soils (b) Marshy and soft soils

(c) Collapsible soils (d) Karst deposits

3. Removal of large quantities of water for dam abutments, cutoffs, landslides etc are

called as

(a) Sump pumping (b) Electro-osmosis

(c) Drainage galleries (d) Gravity drainage

4. \_\_\_\_is the soil capacity to transmit a fluid to pass through its interconnected void spaces.

(a) Seepage (b) Voids (c) Specific capacity (d) Permeability

5. \_\_\_\_\_\_increases both the moist and submerged unit weights of the soil and improves the

angle of internal friction

(a) Vibro-flotation (b) Vibro-compaction

(c) Dynamic consolidation (d) Densification

6. \_\_\_\_\_\_\_\_\_\_\_are installed under a surcharge load to accelerate the drainage of impervious

soils and thus speed up consolidation.

(a) Sand Drain (b) Plastic Drains (c) Prefabricated Drain (d) Vertical drain

7.\_\_\_\_\_\_\_\_\_\_\_\_\_Increases the bearing capacity over weak subgrades.

(a) Ground stabilization (b) Geofoam (c) Geocomposites (d) Geocells

8.\_\_\_\_\_\_\_\_\_\_are more or less rigid bars driven into soil or pushed into boreholes which

are filled with grout

(a) Geotextiles (b) Geogrids (c) Soil nails (d) Geomats

9. \_\_\_\_\_\_\_\_\_\_\_\_intimate one-phase system retaining an originally designed chemical

balance until completion of the relevant reactions.

(a) Suspension grouts (b) Solution Grouts

(c) Point grouting (d) Colloidal solution grouts

10. \_\_\_\_\_\_\_\_\_\_\_\_\_is defined as the process of injecting suitable fluid under pressure into

the subsurface soil or rock to fill voids, cracks and fissures for the purpose of improving

the soil.

(a) Precompression (b) Dynamic compaction

(c) Grouting (d) Blast Densification

PART - B (5 x 2 = 10 Marks)

11. What is expansive soil? Give one example.

12. What are the various methods of dewatering?

13. What is dynamic consolidation?

14. Define geosynthetics.

15. What are the methods adopted in construction of stabilized roads?

PART - C (5 x 16 = 80 Marks)

16. (a) Describe the various geotechnical problems faced with black cotton soil, laterite soil

and alluvial soil deposits. (16)

Or

(b) (i) What are the factors influencing the selection of ground improvement

techniques? (8)

(ii) Explain in detail the role of ground improvement in foundation engineering. (8)

17. (a) (i) Explain the properties and application of flownet. (8)

(ii) Write short notes on Dewatering. (8)

Or

(b) Explain in brief the principle, equipment used with installation and operation

procedures including precautionary measures to be adopted in electro-osmotic

dewatering. (16)

18. (a) Explain in detail the method of dynamic compaction of cohesionless and dynamic

consolidation of cohesive soil. (16)

Or

(b) Write in detail the principle, operation and applications of vibro-compaction method

fo ground improvement. (16)

19. (a) Explain in detail about the application of geosynthetics as separation with the help of

neat sketches. (16)

Or

(b) Explain in detail about the various applications of reinforced earth for ground

improvement with the help of neat sketches. (16)

20. (a) Describe in detail about the various methods of grouting with neat sketches. (16)

Or

(b) (i) Describe in detail the various applications of grouting. (8)

(ii)Write short notes on (a) Pre-grout investigation and (b) Grout holes pattern. (8)