Registration No : | | | | | | | | | | |

Total Number of Pages : 02 **B.Tech.**

PECI5411

8th Semester Regular / Back Examination 2017-18

GROUND IMPROVEMENT TECHNIQUES

BRANCH : CIVIL

Time : 3 Hours

Max marks : 70

Q.CODE : C293

Answer Question No.1 which is compulsory and any five from the rest.

Assume suitable data wherever necessary

The figures in the right hand margin indicate marks.

Q1. **Answer the following questions :** **(2 x 10)**

a) Define and explain Collapse Potential of a soil.

b) Explain what you mean by depth of active zone.

c) Show the differences between sand piles and sand drains.

d) What are the advantages of soil nailing?

e) State where and in which type of soil the use of vibro-flots are essential.

f) State the usefulness of grouting.

g) Enumerate the major functions of geo-synthetics.

h) How to classify a soil in terms of density, if its SPT N-value is 15?

i) What do you mean by tounge-and-groove splice? Where and when are they used?

j) What do you mean by dynamic compaction? How does it help you in dealing with earthquake forces?

Q2. **a)** A soil profile has an active zone of expansive soil of 3 m. The liquid limit and average natural moisture content during the construction season are 54% and 20% respectively. Determine the free surface swell. **(5)**

b) What measures you will take before you start constructions in an expansive soil, a soft soil and a collapsible soil? Explain in brief. **(5)**

Q3. **a)** How do you estimate the bearing capacity of foundations on sanitary land fills? **(5)**

b) Discuss various soil stabilization techniques in brief. **(5)**

Q4. Enumerate various geo-synthetics commonly used for ground improvement techniques? What is a geo-net? What are various properties of a geo-textile which are generally taken into consideration before their use? What are the desirable properties? Differentiate between transmissivity and permittivity? What are various tests conducted on the geo-textiles before their use? **(10)**

Q5. **a)** Discuss the use of a impact roller in densifying the soil to carry the earthquake loads. **(5)**

b) How stone columns and blasting help soil stabilize and gain bearing capacity? **(5)**

Q6. **a)** What do you mean by grouting? Discuss various types of grouting and its advantages through neat sketches. **(5)**

b) How vertical drains help improve soil properties? Sketch an earthquake drain? Briefly explain its operations and usefulness. **(5)**

Q7. **a)** Discuss how reinforcement of soil beneath foundations is done with neat sketches. **(5)**

b) Discuss the steps for analysis and design of reinforced retaining walls. **(5)**

Q8. **Explain any TWO of the following :** **(2 x 5)**

a) Micro-piles

b) Soil nailing

c) Vibrating plates

d) Jet grouting