**Registration no:** | | | | | | | | | | |

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

**PECI5411**

# 8th Semester Regular / Back Examination 2016-17

## GROUND IMPROVEMENT TECHNIQUE

**BRANCH: CIVIL**

**Time: 3 Hours**

**Max marks: 70**

**Q.CODE: Z212**

**Answer Question No.1 which is compulsory and any five from the rest.**
**The figures in the right hand margin indicate marks.**

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

**a)** Show the differences between sand piles and sand drains.
**b)** State where and in which type of soil the use of vibro-flots are essential.
**c)** What is meant by radial consolidation?

**d)** Enumerate the major functions of geo-synthetics.
**e)** What is land fill?
**f)** Sketch an earthquake drain.
**g)** What do you mean by dynamic compaction? How does it help you in dealing with earthquake forces?
**h)** For $\phi' = 28^0$ and $K_0 = 0.43$, calculate the grouting pressure.
**i)** List the types of soil nailing..
**j)** Differentiate between compaction and injection grouting.

**Q2** Discuss the characteristics of a grout. Where and why grouting is required? What is compaction grouting? How is it done in the field? Discuss with neat sketches. Discuss the advantages and disadvantages of grouting. **(10)**

**Q3** A 20 m diameter tank exerts a pressure of 150 kPa on a 10 m thick layer of sand. The ground water table is at 1 m from the surface. The average cone resistance recorded was 20 MPa. Estimate the settlement. **(10)**

**Q4** **(a)** Discuss various compaction control tests in detail. When and why deep surface compaction control tests are resorted to? Explain. **(5)**

**(b)** 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 45% and 20% respectively. Determine the free surface swell. **(5)**

**Q5** **a)** How do we improve the soil properties through excavation and replacement? How and which properties of soil are modified through additives. Name a few additives with their functions and use. **(5)**

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

**Q6** **a)** 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? **(5)**

**b)** What do you mean by accelerated pre-consolidation of clays? How is it achieved? Discuss the use of sand drains and sand wicks for the purpose. **(5)**

**Q7** **a)** What are various dewatering techniques which are generally used for ground improvement? Discuss in brief. **(5)**

**b)** Compare the advantages and disadvantages of ascending stage and descending stage grouting. **(5)**

**Q8** **Write brief notes on any Two** **(5 x 2)**

**a)** Properties of compacted soil
**b)** Reinforced soil embankments
**c)** Soil nailing
**d)** Lime column