

**B.TECH SEM – VII (2007 COURSE) (CIVIL ENGG.) : WINTER -  
2017**

**SUBJECT : FOUNDATION ENGINEERING**

Day : **Friday** Time : **02.30 PM TO 05.30 PM**  
Date : **12/01/2018** **W-2017-2551** Max. Marks : 80

**N.B.:**

- 1) **Q.No.1 and Q.No.5 are COMPULSORY.** Out of the remaining questions attempt **ANY THREE** questions from each section.
- 2) Answers to both the sections should be written in the **SEPARATE** answer books.
- 3) Draw neat and labeled diagrams **WHEREVER** necessary.
- 4) Figures to the right indicate **FULL** marks.
- 5) Assume suitable data if necessary.

**SECTION - I**

- Q.1** a) What are the different stages of soil exploration programme and discuss need for soil investigation for any project? [05]  
b) Define gross safe bearing capacity, net safe bearing capacity, ultimate bearing capacity and allowable soil pressure. [04]  
c) Explain primary consolidation settlement and secondary consolidation settlement. [05]
- Q.2** a) Explain different types of samplers with sketch and give their suitability. [08]  
b) Explain pressuremeter test. [05]
- Q.3** a) What is contact pressure? What are the factors on which it depends? Draw contact pressure distribution diagram for rigid footing. [06]  
b) A strip footing 1.5m wide at its base is located at a depth of 0.5m below the ground surface. The properties of foundation soil are  $r = 18\text{kN/m}^3$   $C = 17\text{kN/m}^2$  and  $\phi = 20^\circ$ . Assume soil fails by general shear. Determine safe bearing capacity:  $N_C = 17.7$   $N_q = 7.4$   $N_r = 5$ , F.S. = 2.5. [07]
- Q.4** a) Explain logarithm of time fitting method. [05]  
b) Explain with graph coefficient of compressibility, coefficient of volume compressibility, compression index and degree of consolidation. [08]

**SECTION – II**

- Q.5** a) What are the limitations of dynamic pile formulae? [05]  
b) Explain necessity of stone column and sand columns. [05]  
c) Explain any four functions of geosynthetics. [04]
- Q.6** a) Discuss briefly on group efficiency and negative skin friction. [06]  
b) A group of nine piles, 12m long and 250mm in diameter is to be arranged in a square pattern in clayey soil with an average unconfined compressive strength of  $60\text{kN/m}^2$  work out the spacing of piles for a group efficiency factor 1.0 neglect bearing at the tip of the piles. [07]
- Q.7** a) How would you check up the stability of an anchored sheet pile wall with free and fixed earth support methods? [07]  
b) Explain design principles of under reamed pile with two underreams and draw neat diagram. [06]
- Q.8** a) Enlist different types of geosynthetics and explain any three with their application. [07]  
b) Explain with neat sketches application of geosynthetics in embankments on soft soils. [06]