Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov/Dec – 2017**

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| **Code :** | **14CE2012** | **Duration :** | **3hrs** |
| **Sub. Name :** | **FOUNDATION ENGINEERING** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Discuss the factors affecting the sample disturbance. | CO1 | 5 |
| b. | Discuss in detail about the salient features of the bore log report. | CO1 | 5 |
| c. | Explain the various objectives of soil exploration. | CO1 | 5 |
| d. | How would you decide the depth of exploration and the lateral extent of the investigations? | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Compute the area ratio of a thin walled tube sampler having an external diameter of 6 cm and a wall thickness of 2.25 mm. Do you recommend the sampler for obtaining undisturbed soil samples? Why? | CO1 | 5 |
| b. | Briefly explain about the various types of soil samplers for obtaining the disturbed and undisturbed samples. | CO1 | 15 |
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| 3. | a. | Describe in brief, various geophysical methods. Discuss their limitations and uses. | CO2 | 10 |
| b. | Outline the various methods of drilling holes for subsurface investigations with neat sketches. | CO1 | 10 |
| (OR) | | | | |
| 4. | a. | Compute the safe bearing capacity of a square footing 1.5 m x1.5m, located at a depth of 1 m below the ground level in a soil of average density 20 kN/ m3. ф = 200 , NC=17.7, Nq = 7.4 and Nγ =5.0. Assume a suitable factor of safety and that the water table is very deep. Also compute the reduction in safe bearing capacity of footing if water table rises to the ground level. | CO2 | 10 |
| b. | Analyze the Terzhagi’s equation for the strip footing. Also how the water table affects the Terzhagi’s bearing capacity equation at different levels. | CO2 | 10 |
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| 5. | a. | Explain plate load test with a neat sketch. Discuss about its uses and limitations. | CO2 | 10 |
| b. | Describe the Meyerhof’s bearing capacity theory. How does it differ from Terzhagi’s theory? | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | List out the different types of earth pressure. Give examples. | CO4 | 5 |
| b. | Discuss in detail the following methods.  i. Rehbann’s method and ii. Culmann’s method to determine the active earth pressure with neat sketches. | CO4 | 15 |
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| 7. | a. | Compare between Rankine’s theory and Columb’s theory of earth pressure. | CO4 | 8 |
| b. | A retaining wall with a smooth vertical back retains a purely cohesive fill. Height of wall is 12m, unit weight of fill is 20 kN/m3, c= 1 N / cm2. What is the total active Rankine thrust on the wall? At what depth is the intensity of pressure zero and where does the resultant thrust act? | CO4 | 12 |
| (OR) | | | | |
| 8. | a. | Design an isolated footing for a column of 300mm x 300mm size subjected to a vertical load of 1500 kN, moment of 200 kN-m and shear load of 250 kN, Take allowable soil pressure is 1400 kN/m2. | CO3 | 15 |
|  | b. | Discuss the various types of loads that are to be considered in the design of foundations. | CO3 | 5 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Define negative skin friction. What is its effect on the pile? | CO3 | 5 |
| b. | A square group of 9 piles was driven into a soft clay extending to a large depth. The diameter and length of the piles were 30 cm and 9 m respectively. If the unconfined compression strength of the clay is 90 kN/m2, and the pile spacing is 90 cm center to center, what is the capacity of the group? Assume a factor of safety of 2.5 and adhesion factor of 0.75. | CO3 | 15 |

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