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

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**End Semester Examination – Nov/Dec– 2018**

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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. | How do you decide the depth of exploration of sub soil? List the factors you will consider. | CO1 | 4 |
| b. | Briefly discuss about the various type of boring with neat sketches. | CO1 | 8 |
| c. | Briefly describe how Electrical resistivity method is used for ground water exploration | CO1 | 8 |
| (OR) | | | |  |
| 2. | a. | What is sampling? Differentiate between non representative and undistributed samples? | CO1 | 4 |
| b. | Discuss briefly the methods of taking undistributed samples in non-cohesive soils and cohesive soil. | CO1 | 8 |
| c. | Explain in detail about the test procedure of static cone penetration test. | CO1 | 8 |
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| 3. | a. | List out the assumptions and limitations of terazahis analysis | CO2 | 4 |
| b. | Explain different types of shear failure of soil with neat sketches. | CO3 | 8 |
| c. | Determine the ultimate bearing capacity of a strip footing, 1.5m wide, with its base at a depth of 1m, resting on a dry sand stratum. Take gamma=17kN/m3; Pie=38 degree. Use IS code method. For pie=38degree,.Nq=48.9 and Nr=56.2 | CO2 | 8 |
| (OR) | | | |  |
| 4. | a. | Define foundation, List out the classification of shallow foundation and deep foundation | CO1 | 4 |
| b. | Explain the plate load test to determine the bearing capacity of soil. | CO1 | 8 |
| c. | Find the net allowable load on a square footing of 2.5m x 2.5m.The depth of foundation is 2m and the tolerable settlement is 40mm.The soil is sandy with Standard penetration Number of 12.Take a factor of safety of 3.The Water table is very deep. | CO2 | 8 |
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| 5. | a. | How do tension cracks influence the distribution of active earth pressure in pure cohesion. | CO1 | 4 |
| b. | Explain the Culmann’s graphical method of calculating active earth pressure with neat sketch. | CO1 | 8 |
| c. | A retaining wall 6m high retains sand with 𝛟=30degree and unit weight 24kN/m2 a depth of 3m from top. From 3m to 6m the material is a cohesive soil with c=20 kN/m2 and 𝛟=20 degree.Unit weight of cohesive soil is 18kN/m3.A uniform surcharge of 100 kN/m2 acts on the top of soil determine the total lateral pressure acting on the wall and its points of applications. | CO2 | 8 |
| (OR) | | | |  |
| 6. | a. | Calculate the active earth pressure give that C=20kN/m2 and unit weight of the soil being 20kN/m3 for a vertical cut of depth 3m.The soil is cohesionless soil. | CO2 | 4 |
| b. | Explain the Rankine’s theory for various backfill condition to calculate active state earth pressure. | CO1 | 8 |
| c. | Explain the Coulomb’s wedge theory of earth pressure with a neat sketch. | CO1 | 8 |
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| 7. | a. | Write the step by step procedure for square footing | CO1 | 4 |
| b. | Design a square footing reinforced concrete for the following data   1. Column load = 800kN 2. Allowable soil pressure = 200 kN/M2 3. Size of the column = 0.4 m x 0.4 m | CO2 | 16 |
|  |  |  |  |  |
| (OR) | | | |  |
| 8. | a. | Design a trapezoidal footing for the two column shown in fig. take allowable pressure as 200 kN/M2 | CO2 | 16 |
|  | b. | Where trapezoidal combined footing is preferred than rectangular footing? |  | 4 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Explain the working principal of pile load test? Write the application and its design consideration? | CO1 | 10 |
| b. | List the methods of pile group? | CO1 | 5 |
| c. | Explain the types of sheet piles? | CO1 | 5 |