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

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

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| **Code :** | **17CE3050** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PROFESSIONAL PRACTICES IN DESIGN OF GEOTECHNICAL STRUCTURES** | **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. | Define sub soil exploration. | CO1 | 2 |
| b. | Highlight on the safety aspects to be taken in offshore geotechnical incestigations. | CO1 | 5 |
| c. | Sketch the borelog sheet indicating salient features and furnish details to be incorporated in geotechnical investigation report. | CO1 | 13 |
| (OR) | | | | |
| 2. | a. | Infer the necessity of management in construction projects. | CO2 | 2 |
| b. | Explain the role of Geosynthetics in ground improvement. | CO2 | 5 |
| c. | Discuss in detail the plant and machinery used in geotechnical investigations. | CO2 | 13 |
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| 3. | a. | Discuss the procedure adopted in the design of retaining wall. | CO3 | 5 |
| b. | A cantilever sheet pile is driven into a soil profile consisting of sand for the top 6m underlain by clay. The water table is at a depth of 3m from the ground level. The unit weight of sand above and below water table is 19kN/m3 and 19.81kN/m3 respectively and its angle of internal friction is 30°. The submerged unit weight and cohesion of the clay are 10kN/m3 and 75kPa respectively. The soil is dredged upto the top of the clay layer. Compute the depth of embankment. | CO3 | 15 |
| (OR) | | | | |
| 4. | a. | Justify when Caisson foundation is preferred. | CO1 | 5 |
| b. | Discuss the different types of caisson foundation and compare its advantages. | CO1 | 15 |
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| 5. | a. | Outline the concept of floating foundation. | CO3 | 5 |
| b. | Design a reinforced concrete precast pile of section 300mmx300mm and of length 8m, fully embedded in a soil of unconfined compressive strength of 50kPa, transmitting load by end bearing, to take an axial load of 600kN. Also, calculate the characteristic value of tensile load the pile can withstand and the corresponding stress in concrete. Adopt M20 concrete and Fe415 steel. | CO4 | 15 |
| (OR) | | | | |
| 6. | a. | List the principles in the design of mat foundation. | CO3 | 5 |
| b. | Design a suitable tower foundation for a double circuit 144kV transmission line without any deviation. The foundation is located in cohesive soil with allowable bearing pressure as 250kN/m2.Consider Cu = 0kN/m2.γ = 17kN/m3 and Φ =35º for computation of uplift only. The foundation is subjected to the loadings as given in the table.   |  |  |  | | --- | --- | --- | | Nature of load | N.C | B.W.C | | Downward (kN) | 200 | 275 | | Uplift(kN) | 150 | 225 | | Shear(transverse)(kN) | 12 | 17 | | Shear (Longitudinal)(kN) | - | 8 | | CO3 | 15 |
|  |  |  |  |  |
| 7. | a. | Discuss the step-step procedure in the design of earthquake resistant foundation. | CO3 | 10 |
| b. | Explain any one method to determine the dynamic properties of soil. | CO5 | 10 |
| (OR) | | | | |
| 8. | a. | Discuss the effects of damping on soil structure interaction. | CO5 | 10 |
| b. | Discuss on the analysis of structural response based on dynamic properties of soil. | CO5 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Explain the steps involved in modeling of sheet pile by using PLAXIS software. | CO6 | 10 |
| b. | Discuss the various applications of FEA software in Geotechnical Engineering. | CO6 | 10 |