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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – April / May – 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. | Briefly explain about the various types of soil samplers for obtaining the disturbed and undisturbed samples. | CO1 | 15 |
| b. | Discuss the stages involved in sub surface explorations. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Outline the various methods of drilling holes for subsurface investigations with neat sketches. | CO1 | 15 |
| b. | Describe the salient features of a good sub-soil investigation report. | CO1 | 5 |
| 3. | a. | Discuss standard penetration test. What are the various corrections? What is the importance of the test in geotechnical engineering? | CO2 | 15 |
|  | b. | What are the conditions where a pile foundation is more suitable than a shallow foundation? | CO3 | 5 |
| (OR) | | | | |
| 4. | a. | Describe the various types of pile foundation. | CO3 | 12 |
|  | b. | What are the factors governing the selection of foundation? | CO3 | 8 |
| 5. | a. | Explain in detail about the different types of shear failure with neat sketch. | CO2 | 10 |
|  | b. | Determine the allowable gross load and net allowable load for a square footing of 2m side and with a depth of foundation 1m. Use Terzhagi’s theory and assume local shear failure. Take a factor of safety of 3. The soil at the site has angle of internal friction = 25°, unit weight of soil = 18kN/m3 and cohesion = 15kN/m2. | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | 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 | 15 |
|  | b. | A square footing 2 x 2 m is built on a homogeneous bed of sand of unit weight 18 kN/m3 having frictional angel of 36°. The depth of foundation is 1.5m. Calculate the safe load that can be carried out by the footing with a factor of safety of three against shear failure. Use Terzaghi’s theory. Take:  (Nq = 49 and Nr = 54). | CO2 | 5 |
| 7. |  | Derive an expression for Rankine’s active and passive earth pressure coefficient with neat sketches, assuming the soil is Cohesive. | CO4 | 20 |
| (OR) | | | | |
| 8. | a. | Discuss in detail about to determine the active earth pressure with neat sketches by   1. Rehbann’s method 2. Culmann’s method | CO4 | 10 |

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|  | b. | Determine the active pressure and the line of action of the force on the retaining wall. γw= 10kN/m3 | CO4 | 10 |
|  | | **Compulsory:** |  |  |
| 9. |  | Design an isolated footing for a column of 450mmx450mm size subjected to a vertical load of 2500kN, moment of 400kN-m and shear load of 360 kN, Take allowable soil pressure id 1400kN/m2 | CO3 | 20 |