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



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

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| **Code :** | **18CE3064** | **Duration :** | **3hrs** |
| **Sub. Name :** | **STRENGTH AND DEFORMATION CHARACTERISTICS OF SOILS** | **Max. marks :** | **100** |

**ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** | |
| 1. | a. | Demonstrate Terzaghi’s one dimensional consolidation theory. | CO1 | 8 | |
| b. | Enumerate consolidation of indisderbed soil specimen. | CO1 | 8 | |
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| 2. | a. | Determine the shear strength in terms of effective stress on a plane within a saturated soil mass at a point where the total normal stress is 200 kN/m2 and the pore water pressure is 80kN/m2 . the effective stress strength parameters for the soil are:c’= 16kN/m2 and Ø=30 °. | CO2 | 12 | |
| b. | Explain the volume change behavior of soil and its strength parameters. | CO1 | 4 | |
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| 3. | a. | List out the limitations of vane shear test. | CO2 | 4 | |
| b. | A vane 10 cm long and 8cm in dia was pressed into soft clay at the bottom of bore hole .Torque was applied and gradually increased to 45 N-m when failure took place subsequently the vane was rotated rapidly so as to completely remould the soil . The remoulded soil was sheared at the torque of 18N-m . Calculate the cohesion of clay in the natural state and also the value of sensitivity. | CO2 | 12 | |
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| 4. | a. | Define Mohr Coulomb failure criteria. | CO3 | 8 | |
| b. | Elaborate Hvorslev shear strength parameter. | CO3 | 8 | |
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| 5. | a. | A cylinder of soil fails under an axial load of 160kN/m2 ,when it is laterally unconfined the failure plane makes an angle of 50° with the horizontal . Calculate the value of cohesion and the angle of internal friction of the soil. | CO4 | 8 | |
| b. | A lateral pressure in a triaxial compression test in a cohesive soil gave the following results: angle of shearing resistance Ø = 7.5° ; cohesion =3.0kg/cm2 ; total axial stress at failure = 18kg/cm2; determine the lateral pressure. | CO5 | 8 | |
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| 6. | a. | Discuss in detail about any two of the yield criteria listed bellow  i.Von mises.  ii.Tresca.  iii.Kvickpatriak. | CO4 | 12 | |
| b. | Detail about the total stress and effective stress approach on soil. | CO3 | 4 | |
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| 7. |  | The effective stress shear strength parameters of a completely saturated clay are c’=20kN/m2 ; Ø = 25° ; a sample of this clay was tested in UU test under a cell pressure of 200kN/m2 and the principal stress difference at the failure was 110kN/m2. What was the value of pour water pressure at the failure? | CO5 | 16 | |
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| **COMPULSORY QUESTION (1 x 20 = 20 Marks)** | | | | | |
| 8. | a. | Define dilatancy and overburden correction factors for SPT. | CO3 | | 10 |
| b. | Explain liquefaction and liquefaction potential with neat sketch | CO6 | | 10 |