Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code: 44102

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Fourth Semester

Civil Engineering

14UCE402 - SOIL MECHANICS

(Regulation 2014)

Duration: One hour   Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Identify for which the particle size distribution curve with hump is obtained for

    (a) Uniform soil   (b) Well graded soil
    (c) Gap-graded soil   (d) Poor graded soil

2. Predict the range of optimum water content for standard proctor test for clay soil is

    (a) 6 to 10 %   (b) 8 to 12 %   (c) 12 to 15 %   (d) 14 to 20 %

3. A flow net has 4 flow channels and 20 equi-potential drops, the shape factor is

    (a) 1/5   (b) 5   (c) 8   (d) None of these

4. The possibility of quick sand condition will be there when flow of water to soil is

    (a) Horizontal   (b) upwards
    (c) downwards   (d) laterals

5. Compaction of a soil is measured in terms of

    (a) dry density   (b) specific gravity
    (c) compressibility   (d) permeability

6. When Consolidation of a Saturated soil Sample occurs, the degree of Saturation

    (a) increases   (b) decreases
    (c) Remains constant   (d) May increases or decreases

7. When drainage is permitted throughout the triaxial test, the test is known is

    (a) Quick test   (b) Drained Test
    (c) Consolidated undrained test   (d) None of these

8. The shear strength of a Cohesionless Soil is

    (a) proportional to the angle of Shearing Resistance
    (b) Inversely proportional to the angle of Shearing Resistance
    (c) proportional to the tangent of the angle of shearing resistance
    (d) None of these

9. Stability of an infinite slope is lowest for

    (a) Partially saturated soil   (b) Dry soil
    (c) seepage parallel to slope   (d) Horizontal seepage

10. Identify incorrect statement, the stability of a slope is decreased by

    (a) removal of a part of slope excavation   (b) shock caused by an earthquake
    (c) pore water pressure in the soil   (d) providing a berm at toe

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11.   Discuss methods of Compaction used in field.   (8)

12.   The water table in a certain area is at a depth of 4m below the ground surface. To a depth of 12m, the soil consists of very fine sand having an average voids ratio of 0.7. Above the water table the sand has an average degree of saturation of 50%. Calculate the effective pressure on a horizontal plane at a depth 10m below the ground surface. What will be the increase in the effective pressure if the soil gets saturated by capillarity upto a height of 1m above the water table? Assume G = 2.65.   (8)

13.   A stratum of normally consolidated clay 7m thick is located at a depth of 12m below ground level. The natural moisture content of the clay is 40.5% and its liquid limit is 48%. The specific gravity of the solid particles is 2.76. The water table is located at a depth of 5m below ground surface. The soil is sand above the clay stratum. The submerged unit weight of the sand is 11 kN/m^3 and the same weighs 18 kN/m^3 above the water table. The average increase in pressure at the centre of the clay stratum is 120 kN/m^2 due to the weight of a building that will be constructed on the sand above the clay stratum. Estimate the expected settlement of the structure.   (8)

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14. Describe about Vane shear Test. Give its merits and demerits. (8)

15. Describe the types of slope failure with neat sketches. (8)

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