Assignment No:	ALL	Assignments	
Sub Code	X40603	Title of Subject	Soil Engineering

Chapter – 1 Stress distribution in soil

1. Enlist assumption made in Boussinesq's theory of stress distribution.
2. Explain about vertical stress distribution, on horizontal plane and on vertical line.
3. Derive the equation of K_A for Rankine's theory.
4. A concentrated load of 22.5 kN acts on a surface of a homogeneous soil mass of large extent. Find astress intensity at a depth of 15 m (i) directly under the load and (ii) at a horizontal distance of 7.5 m. Use Boussinesq's equation.
5. Calculate the vertical stress at a point P at a depth 2.5 m directly under the center 0f the circular area of radius 2 m and subjected to a load 100 kN/m^2. Also calculate the vertical stress at point Q which is at the same depth of 2.5 m away from the centre of the loaded area.

Chapter – 2 Shear strength Of Soil

1. Explain Modified Mohr-coulomb theory.
2. Explain Direct Shear Test.
3. Discuss shear tests based on different drainage conditions.
4. Two identical specimen of a soil were tested in a triaxial apparatus. First specimen failed at a total stress of 770 kN/m^2 when the cell pressure was 200kN/m^2, while the second specimen failed at a total stress of 1370 kN/m^2 under a cell pressure of 400 kN/m^2. Determine the value of c and Φ for the soil. If the same soil is tested in a direct shear apparatus estimate the shear stress at which the sample will fail under a normal stress of 600 kN/m^2

Chapter – 3 Compaction

1. Differentiate between standard proctor test and Modified proctor test.
2. Write short note on Compaction needle.
3. Differentiate between consolidation and Compaction with examples.

Chapter – 4 Consolidation of soils

1. Explain any method to determine coefficient of consolidation.
2. Discuss the limitation of Terzaghi's theory of consolidation.
3. Explain Square root of time methods to determine coefficient of consolidation.
4. In a consolidation test following result have been obtained when the load was changed from50 kN/m^2 to 100 kN/m^2,void ratio changed from 0.7 to 0.65. Determine the coefficient of volume decrease (mv) and compression index (Cc).
5. How many days would be required by a clay stratum 5.5 m thick, draining at both ends with an average value of coefficient of consolidation = $54x10^{-4}cm^2/sec$, to attain 50% of its ultimate settlement.

Chapter – 5 Earth pressure

1. Describe the wedge theory to determining the active earth pressure and also discuss the advantages of it.
2. Describe the Culmann's graphical method to evaluate active thrust.
3. Derive an expression for active pressure when the ground surface in inclined.
4. Differentiate critically between Rankineand Coulomb theories of earth pressure.
5. Discuss about earth pressure at rest. What is active and passive earth pressure?
6. A retaining wall, 6 m high, retains dry sand with an angle of friction of 30° and unit weight of $16.2kN/m^3$. Determine the earth pressure at rest. If the water table rises to the top of the wall, determine the increase in the thrust on the wall. Assume the submerged unit weight of sand as $10kN/m^3$.
7. A retaining wall has a vertical back and is 8m high. The back force of the wall is smooth and the upper surface of the fill is horizontal. Determine the thrust on the wall per unit length. Take c = 10 kN/m^2, γ=19 kN/m^3 and Φ = 20°.

Chapter – 6 Stability of slopes:

1. Write a short note on stability analysis of Infinite slopes for c - Φsoils.
2. What are the assumptions that are generally made in the analysis of the stability of slopes? Discuss briefly their validity.
3. Explain swidish circle method to get factor of safety.
4. An embankment is inclined at angle 35° and its height is 15 m. The angle of shearing resistance is 15° and cohesion intercept is 200 kN/m^2. the unit weight of soil is 18 kN/m^3. If the Taylor's stability number is 0.06, find the factor of safety with respect to cohesion.