Student Worksheet – 1
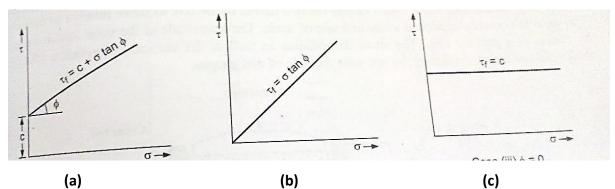**Introduction to Shear Strength of Soil**
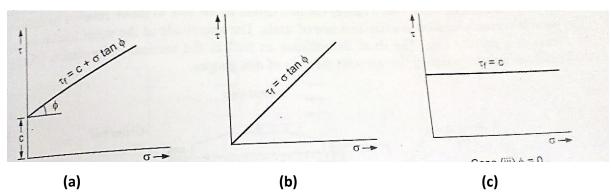
Choose the best Answer

1. **When the compressive load act on the soil the stresses induced ………………………**

   a. Compressive and Shear Stress
   b. Tensile Stress & Shear Stress
   c. Tensile and Compressive stress
   d. None

2. **The shear strength of soil is analysed by ……………………………..**

   a. Mohr's Theory
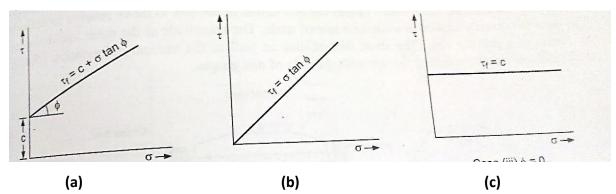   b. Westerguard's Theory
   c. Boussinesq's Theory
   d. None

3. **Mohr Coulomb's Failure Envelope for Cohesionless Soil is …………………………….**

| (a) | (b) | (c) |

4. **Mohr Coulomb's Failure Envelope for Cohesive Soil is ……………………………..**

| (a) | (b) | (c) |

5. **Mohr Coulomb's Failure Envelope for Purely Cohesive Soil is ……………………………..**

| (a) | (b) | (c) |

Student Worksheet – 2
Direct Shear Test

The result of a direct shear test on a 60 mm x 60 mm specimen are given below. Determine the shear strength parameters.

Normal Load (N)	300	400	500	600
Shear Force at Failure (N)	225	332	359	392

Student Worksheet – 3
Vane Shear Test

A vane, 10 cm long and 8 cm in diameter, was pressed into soft clay at the bottom of a bore hole. Torque was applied and gradually increased to 45 N-m when failure took place. Subsequently, the vane rotated rapidly so as to completely remould the soil. The remoulded soil was sheared at a torque of 18 N-m. Calculate the cohesion of the clay in the natural and remoulded states and also the value of the sensitivity.

Student's Worksheet – 4

Triaxial Compression Test

Two identical soil specimens were tested in a triaxial apparatus. First specimen failed at a deviator stress of 770 kN/m^2 when the cell pressure was 2000 kN/m^2. Second specimen failed at a deviator stress of 1370 kN/m^2 under a cell pressure of 2300 kN/m^2. Determine the value of c and Φ analytically. If the same soil is tested in a direct shear apparatus with a normal stress of 600 kN/m^2, estimate the shear stress at failure.

Student's Worksheet – 5

Unconfined Compression Test

An unconfined compression test was conducted on an undisturbed sample of clay. The sample had a diameter of 38 mm and length 76 mm. The load at failure was 30 N and the axial deformation of the sample 11 mm. Determine the undrained shear strength parameters, if the failure plane made an angle of 500 with horizontal.

Student's Worksheet - 6
Pore Pressure Parameters

In a triaxial test of soil specimen was consolidated under cell pressure of 700 kN/m² and the increased pore pressure was 450 kN/m². The axial load was then increased to give a deviator stress of 570 kN/m² and pore pressure reading of 650 kN/m². Calculate the pore pressure parameters.

Student's Worksheet - 7
Liquefaction

Find out which type of Liquefaction Failures

1.   …………………………………………..

2. ………………………………………

3. …………………………………………………..