

ES 3202

Mid-semester Examination

Geotechnical Engineering

1. What is the shrinkage limit of soil? Explain with a diagram. The weight and volume of a fully saturated soil sample were 55.4 g and 29.2 cc respectively. After drying in an oven for 24 hours, its weight and volume reduced to 39.8 g and 21.1 cc respectively. Find the shrinkage limit of the soil. (6)
2. It is required to excavate a long trench in a sand deposit upto a depth of 3.5 m below GL. The sides of the trench should be vertical and are to be supported by steel sheet piles driven up to 1.5 m below the bottom of the trench. The ground water table is 1 m below GL. In order to have a dry working area, water accumulated in the trench will be continuously pumped out. If the sand has a void ratio of 0.72 and the specific gravity of the soil solids is 2.66, check whether a quicksand condition is likely to occur. (8)

Hint: Compare the hydraulic gradient with the critical hydraulic gradient.

3. Draw the diagram of a groundwater basin showing the different types of aquifers and wells. (6)

Ans
22/2/19