Anantha Lakshmi
Institute of Technology & Sciences

Approved by AICTE & Affiliated to JNTUA, Ananthapuramu,
An ISO (9001-2008) Certified Institute, Near S.K.U, Itikalapalli, Ananthapuramu Dist. A.P.

DEPARTMENT OF CIVIL ENGINEERING

GEOTECHNICAL ENGINEERING

TUTORIAL QUESTIONS

1	Show I.S soil classification based on grain size?
2	Difference between IS light and Heavy Compaction?
3	Derive an equation for Quick Sand Condition?
4	Explain how the Newmark's Chart is prepared and how it is used?
5	A dry soil has a void ratio of 0.65 and its grain specific gravity is= 2.80. What is its unit weight? Water is added to the sample so that its degree of saturation is 60% without any change in void ratio. Determine the water content and unit weight. The sample is next placed below water. Determine the true unit weight (not considering buoyancy) if the degree of saturation is 95% and 100% respectively?
6	In order to compute the seepage loss through the foundation of a cofferdam, flow nets were constructed. The result of the flow net study gave N= 6, N_d = 16. The head of water lost during seepage was 19.68m. If the hydraulic conductivity of the soil is $k = 13.12 \times 10\text{-}5$ m/s, compute the seepage loss per meter length of dam per day?
7	An oedometer test is performed on a 3 cm thick clay sample. After 5 minutes, 50% consolidation is reached. After how long a time would the same degree of consolidation is achieved in the field where the clay layer is 6 m thick? Assume the sample and the clay layers have the same drainage boundary conditions (double drainage).
8	A Newmark's chart was prepared with the influence coefficient of 0.005 with the desired scale the stress concentrated area is drawn on tracing paper. Then the tracing paper is placed on top of the influence chart with the desired position.

	Then number of sectors covered by the stress area is 31. Compute the stress at the given position for the desired stress area. Applied on the area is 200 kN/m2
9	A soil strata consists of 3 layers of thickness 1 m, 1.5 m and 1.9 m having the coefficients of permeability of 2.3×10^{-3} cm/s, 1.85×10^{-3} cm/s and 3.5×10^{-4} cm/s respectively. Estimate the average coefficient of permeability in the direction: i) parallel and ii) normal to the flow.
10	There is a layer of soft clay 4 m thick under a newly constructed building. The overburden pressure over the center of the clay layer is 300 kN/m^2. Compute the settlement, if there is an increase in pressure due to construction of 100 kN/m^2. Take $C_c = 0.50$, $G = 2.70$. The water content of the deposit was found to be 50 %.
11	Explain any one method to compute coefficient of consolidation
12	Sketch the stress –strain relationship for dense sand and loose sand
13	The following values of sand are given: $D_{60} = 0.77$ mm, $D_{30} = 0.41$ mm and $D_{10} = 0.30$ mm. Determine, C_u and C_c and state if it is a well graded or poorlygraded soil?