Menoufiya University Faculty of Engineering Shebin El-Kom	Year 2014 Department: Civil Subject: Soil Mechanic Time Allowed: 3 hours Date : 22/1/2014 Total Marks : 90

Tables and charts Allowed

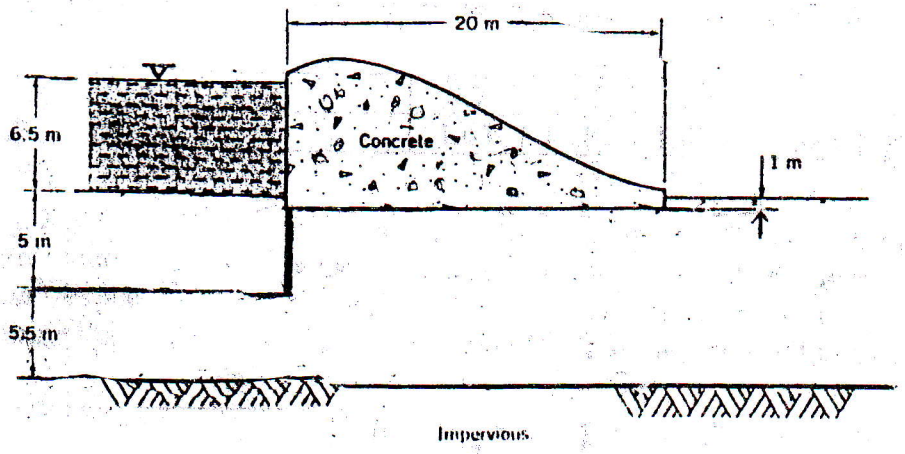
Answer all the following Questions:-

Q.1 **(a) - A high building 13- stores was built in Shebin El-kom adjacent to another building consists of 6 stores only. What is the effect of 13- stores building on the ground underneath the 6 stores building. If the 6-storey was demolished and a new one of 10 - storey was built, what is the change which will occur Explain.**

(b) - i - Why the coller is used in compaction test.
ii - Name two basic devices (as mentioned in lecture) used always in soil mechanics lab .
iii - Engineering judement is needed in all phases of engineering practice, but perhaps even more so in Soil Mechanices. Explain why

(15 Degrees)

Q.2 **(a) - Draw flow net carefully and find q / m width, $k = 30 \times 10^{-4}$ cm/s. There ia a 5-m cutoff wall as shown in Figure below.**



(b) - Define the pressure bulbs and show how they can be used in deciding depth of borings.

(c) - Explain and prove seepage velocity. (18 Degrees)

Q.3 **(a) - The dry density of a sandy soil sample is 1.85 gm/cm^3 .The maximum and minimum dry densities for this type of soil is 1.90 gm/cm^3 and 1.40 gm/cm^3 respectively Find the relative density of this sample.**

(b)- A soil has been compacted to a bulk density of 2.15 gm/cm^3 and a water content of 12% . The value of $G_S = 2.65$ Calculate the dry density, void ratio and degree of saturation .

(15 Degrees)

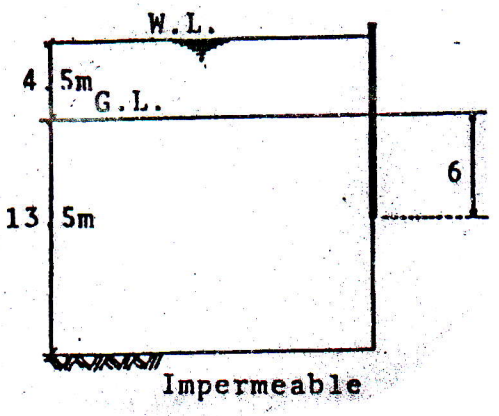
Q.4 (a)- Define the two methods used for piping alleviation.

(b)- A sheet-pile wall is driven to a depth of 6m into permeable soil which extends to a depth of 13.5m below ground level. Below this, there is an impermeable stratum. There is a depth of 4.5m on one side of the sheet pile wall. Make a neat sketch of the flow net and determine the approximate seepage under the sheet pile wall in m^3 per day, taking the permeability of the soil as 6×10^{-3} mm/sec.

(Assume soil density of 1900 kg/m^3)

Find the critical hydraulic gradient ic .

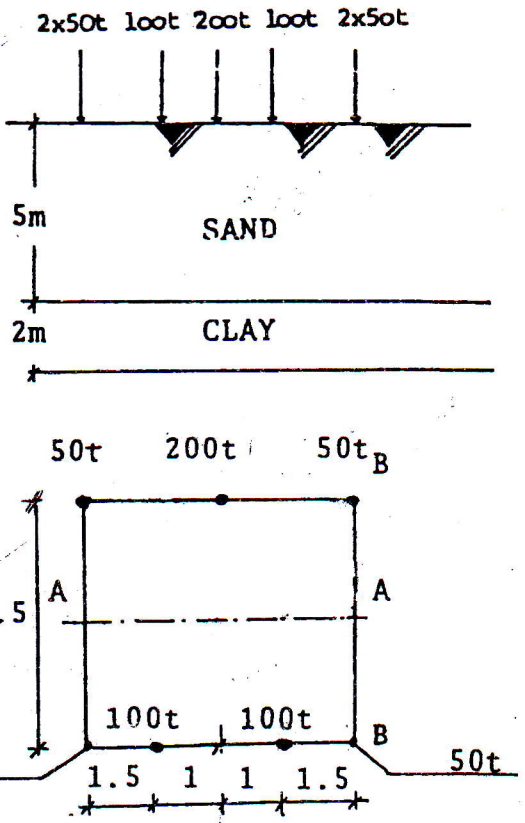
show (using the flow net) if piping in front of the sheet piling is likely to occur or not.



(21 Degrees)

Q.5 (a)- The water table is lowered from a depth of 10 ft. to a depth of 20ft. in a deposite of silt. All the silt is saturated, even after the water table is lowered. Its water content is 26%. Estimate the increase in effective pressure at a depth of 34 ft on account of lowering the water table, $\gamma_w = 26.4$ Ib / ft^3 .

(b)- Determine the vertical stress distribution at mid - depth of the clay layer along ... A-A and B-B of the building shown in the figure.



(21 Degrees)

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