**(3 Hours)**                    **[Total Marks : 80**

Note 1. Attempt any 4 out of six questions
   2. Question 1 is compulsory
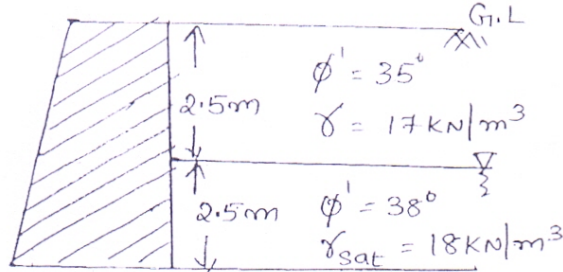   3. Assume any suitable data where ever required

Q.1        Attempt any four

   a.    What are the methods for improving the stability of slopes                    05

   b.    A retaining wall 6m height with a smooth vertical back fill is pushed against soil mass    05
         having $C=40kN/m^2$ and $\phi=15^0$ $\gamma=19kN/m^3$. What is the total Rankine passive pressure
         if the horizontal soil surface carries a load of 50 $kN/m^2$ What is the point of
         application of resultant thrust

   c.    Compare ditch condition and projection condition                    05

   d.    Differentiate general local and punching shear failure                    05

   e.    Explain the advantages of reinforced soil                    05

   f.    Explain the limitations of plate load test                    05

Q.2   a.    Explain the friction circle method for finding factor of safety of slopes                    10

   b.    A section of cantilever retaining wall as shown in figure the back fill has $C=0$ $\phi=41^0$    10
         $\gamma=16kN/m^3$ .water table is considerable depth below ground surface. the Backfill
         carries a uniform surcharge load of $35kN/m^2$ check the stability of retaining wall
         assume the unit weight of concrete is $24kN/m^3$ safe bearing capacity of soil below the
         base is $500kN/m^2$
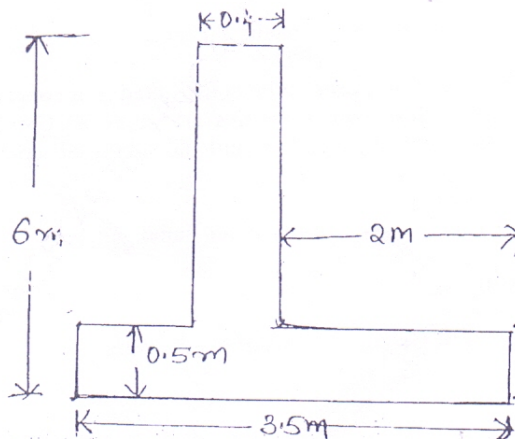


I                                              **[TURN OVER**

Q.3  a.  Determine the active thrust and point of application on retaining wall as shown in          10 +10
figure



Q.4  a.  A rectangular footing 2x3m rests on soil with its base at 1.5m below ground surface.          08
calculate the safe bearing capacity using the factor of safety 3 on
(i)      Net ultimate bearing capacity
(ii)     Ultimate bearing capacity of soil having following properties $C=10kN/m^3$
$\phi=36^0$ $\gamma=18$ kN/m$^3$

b.  Briefly explain group capacity of piles                                                                          06

c.  Explain apparent earth pressure diagram constructed for non uniform soil deposit          06

Q.5  a.  A square pile group of 16 piles penetrate through a filled up soil of 3m depth. The pile          10
diameter is 250mm and the pile spacing is 0.75m. the unit cohesion of the material is
$18kN/m^3$ and unit weight of the soil is $15kN/m^3$ compute the negative skin friction on
the group

b.  Describe briefly Rehbann's graphical method for active earth pressures                              10

Q.6      Answer any four of the following                                                                          20

a.  Briefly explain cyclic pile load test

b.  Differentiate Terzaghi's and Meyorhof's bearing capacity theories

c.  A canal is having a side slope of 1 to1 is proposed to be constructed in a cohesive soil
to the depth of 5m below ground surface. soil properties are given as $C=12kN/m^2$
$\phi=15^0$ e=1.0, G=2.65 using Taylor's stability number find the factor of safety with
respect to cohesion against the failure of bank slopes
(i)      When the canal is full of water
(ii)     When there is sudden drawndown of water in the canal

d   Explain briefly on joints in the retaining wall

e.  Explain briefly different applications of Geotextiles in soil engineering

FW-Con.8155-16.

QP Code: 31628

**Correction:**

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please find the correction in Question No. 3 instead of 10 Marks consider 20 marks there is no (b) question

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Date and Time 10/05/2016 05:01 PM