T.E. Civil VI CBGS
Geotech. Engg -II

10.5.16
QP Code : 31628

(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 $500kN/m^2$
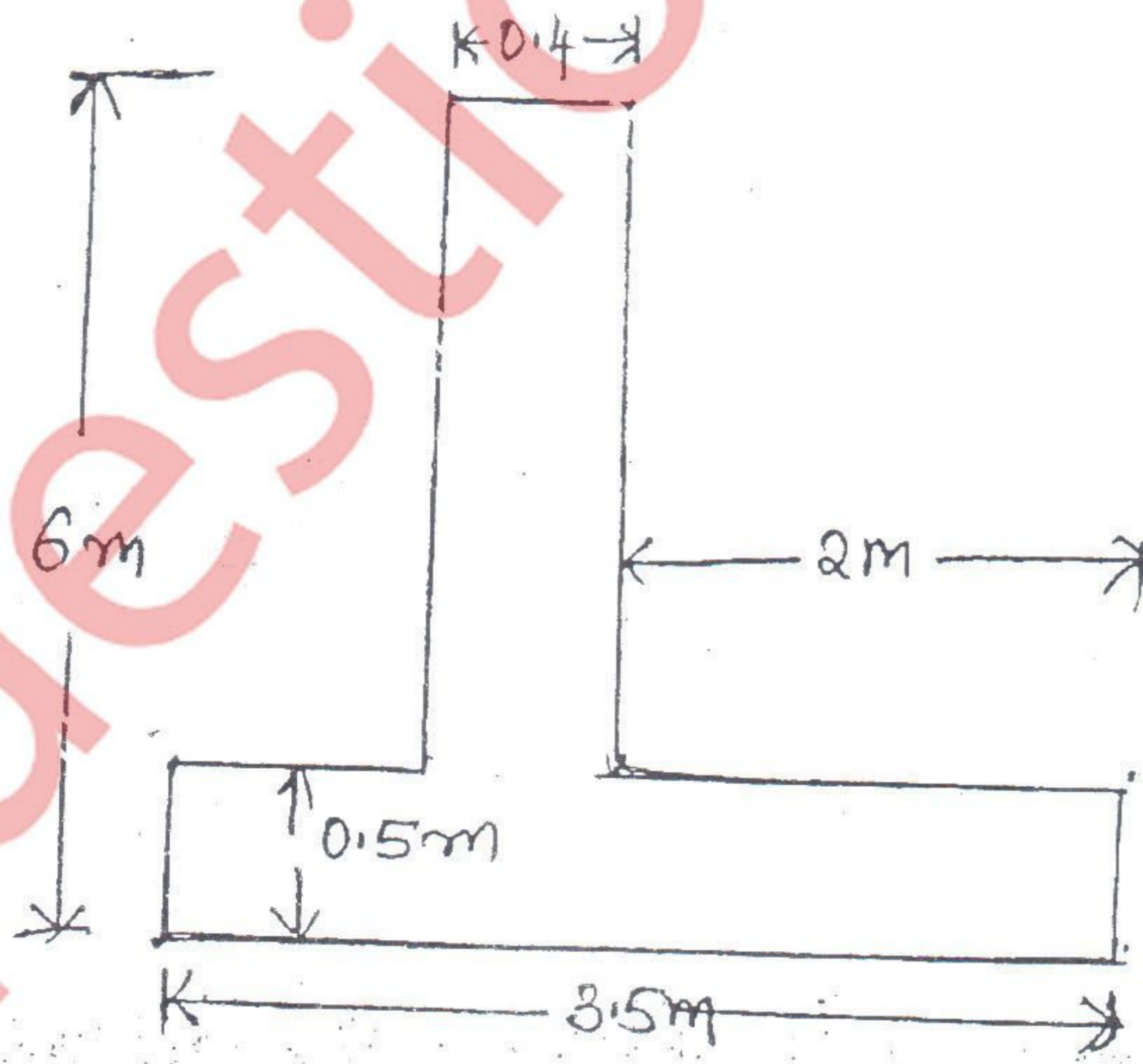
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Q.3 a. Determine the active thrust and point of application on retaining wall as shown in figure   10
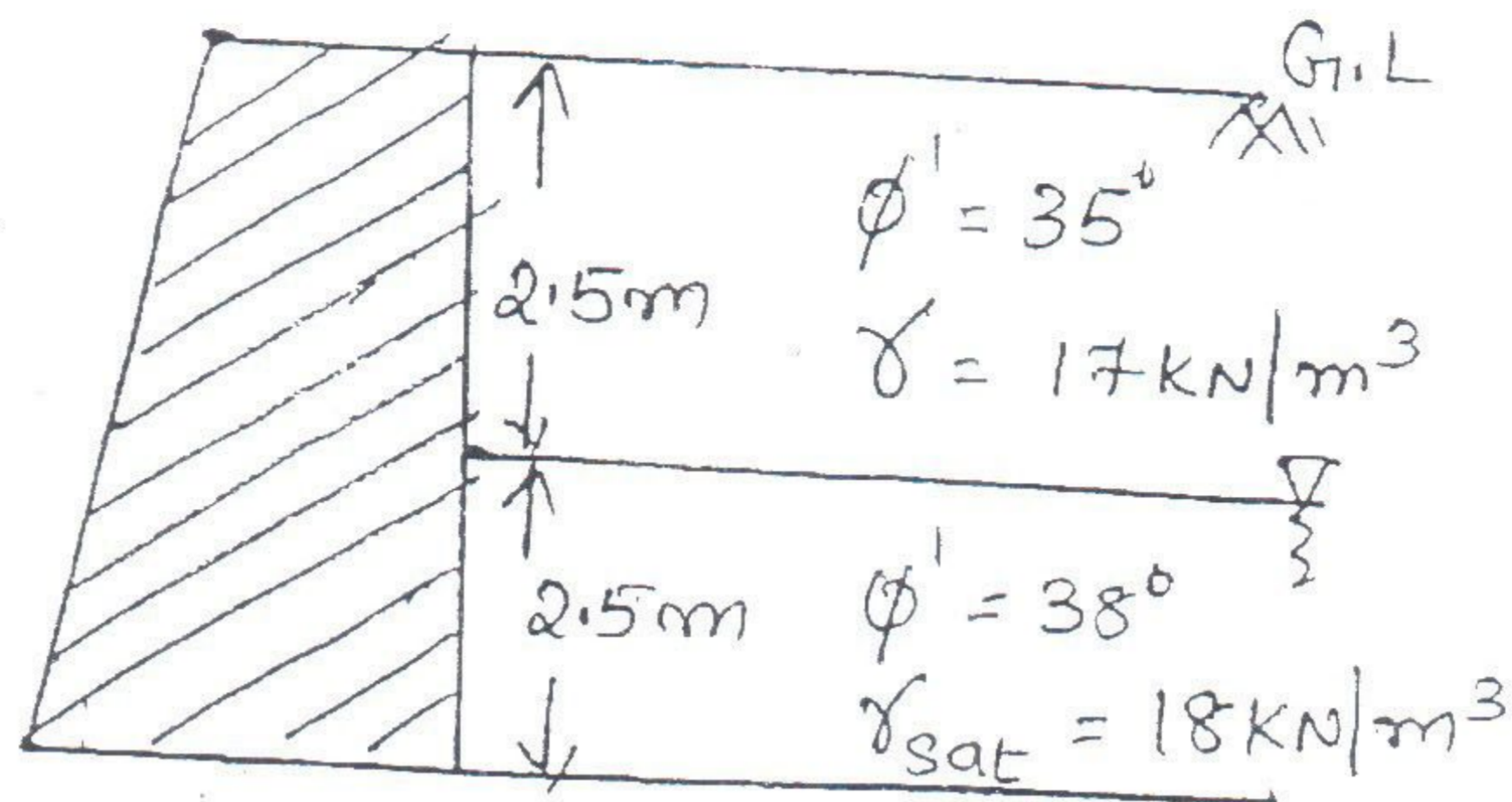
Q.4 a. A rectangular footing 2x3m rests on soil with its base at 1.5m below ground surface. calculate the safe bearing capacity using the factor of safety 3 on   08
   (i)   Net ultimate bearing capacity
   (ii) Ultimate bearing capacity of soil having following properties $C=10kN/m^3$ $\phi=36^0$ $\gamma=18$ kN/m³

   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 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   10

   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 ! 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 drawdown of water in the canal

   d Explain briefly on joints in the retaining wall

   e. Explain briefly different applications of Geotextiles in soil engineering

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