Total No. of Printed Pages:2

SUBJECT CODE NO:- H-157
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (Civil)
Geotechnical Engineering
(REVISED)

[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B   1) Q.1 & Q.6 are made compulsory. Solve any two questions from remaining questions of each section.
2) Assume suitable data if required & state it clearly.

Section A

Q.1   Attempt any five.   10
a) What is mean by consistency of soil?
b) Define equipotential line.
c) What is adsorbed water & Capillary water?
d) Draw soil sample as a three phase in terms of voids ratio & porosity.
e) What is swelling of soil?
f) What is zero air void line?
g) What is soil thixotropy?

Q.2   a) A soil strata consist of 3 layers of soil thickness 1m, 1.5m & 2.0m having coefficient of permeability   08
of $3 \times 10^{-3} \, cm/sec$, $4.5 \times 10^{-3} \, cm/sec$, & $3 \times 10^{-3} \, cm/sec$, respectively. Estimate the average coefficient of permeability in the direction
i)   Parallel to the bedding plane
ii)   Normal to the bedding plane.
b) What is the classification of soil? Explain Indian Standard Classification?   07

Q.3   a) What are the different soil indices used in identification of soil? Describe each briefly. Give their   08
uses.
b) Derive an expression to determine coefficient of permeability of course grain soil by laboratory test. 07

Q.4   a) What is optimum moisture content? Explain factors affecting compaction?   07
b) Derive the relation between bulk density, specific gravity. Void ratio degree of saturation & density   08
of water.

Q.5   a) Discuss Terzaghi's theory of consolidation by stating the various assumption & its validity.   08
b) Discuss primary & secondary consolidation   07

Section B

Q.6   Attempt any five.   10
      a) Define semi infinite soil mass
      b) What do you mean by shear strength of soil?
      c) Enlist slope failure.
      d) What is stability curve?
      e) Draw the sketch showing variation of earth pressure with the movement of the wall.
      f) Enlist the method to determine shear strength.
      g) What is 2:1 stress distribution method?
      h) Under what condition box test issued?

Q.7   a) Explain shear characteristics of sand?   05
      b) In an unconfined compression test, a sample of sandy clay 8 cm long 24 cm in diameter fails under a   10
          load of 120KN at 10% strain. Compute the shearing resistance taking into account the effect of
          change in cross section of the sample.

Q.8   a) Explain Taylor's Stability number.   08
      b) Discuss Swedish method & its application to dry cohesive soils.   07

Q.9   a) What are the assumptions made in Rankine theory. Justify any two.   08
      b) Enlist the different cases of cohesion less backfill to be considered to calculate earth pressure.   07
          Explain any one of them.

Q.10   Short notes(Attempt any three)   15
      a) Determination of elastic modulus from triaxial test.
      b) Classification of slope failure
      c) Stability curve
      d) Unconfined compression test
      e) Contact pressure
      f) Boussinesq's equation for point load.