Total No. of Questions—8]　　　　　　　[Total No. of Printed Pages—2

Seat
No.

[5352]-503

S.E. (Civil) (I Sem.) EXAMINATION, 2018
GEOTECHNICAL ENGINEERING
(2015 PATTERN)

Time : Two Hours　　　　　　　　　Maximum Marks : 50

N.B. :— (*i*) Answer Q. No. **1** *or* Q. No. **2**, Q. No. **3** *or* Q. No. **4**, Q. No. **5** *or* Q. No. **6**, Q. No. **7** *or* Q. No. **8**.
　　　　(*ii*) Neat diagrams must be drawn wherever necessary.
　　　　(*iii*) Figures to the right indicate full marks.
　　　　(*iv*) Use of calculator is allowed.
　　　　(*v*) Assume suitable data, if necessary.

Q1) a) Describe briefly the procedure for conducting liquid limit test as per I.S. 2720. [6]
How the result of this test are plotted. Draw the typical sketch of the plot.

b) What is flow net? Write down the characteristics and application of flow net. [6]

OR

Q2) a) Derive the relation between γd, G and e. [6]

b) Explain with neat sketch variable head permeability test. Derive the expression [6]
for coefficient of permeability of soil for the variable head method.

Q3) a) Explain briefly the procedure of conducting unconfined compression test on [6]
clayey soil sample. Draw Mohr's circle for the test.

b) A concentrated load of 25 kN acts on the surface of homogeneous soil mass of [6]
large extent. Find the stress intensity at a depth of 8.0 meters by using
Boussinesq's theory at a horizontal distance of 2.5m

OR

Q4) a) In case of Direct shear test ,the value of normal stress and corresponding shear [6]
stress are given as;
σ = 75 KPa,　τ = 61.3 KPa
σ = 125 KPa, τ = 90.168 KPa
σ = 175 KPa, τ = 119.036 KPa
Determine cohesion and angle of internal friction of soil.

　　　　　　　　　　　　　　　　　　　　　　　　　　　　P.T.O.

b) Differentiate between light compaction test and heavy compaction test. Draw [6] typical compaction curve for both tests.

Q5) a) Explain Rankine's lateral stress distribution theory for active, passive and at rest [6] state with the assumptions involved.

b) A wall with a smooth vertical back, 10m high, supports a purely cohesive soil [7] with c = 9.81 kN/m^2 and γ = 17.66 kN/m^3. Determine total Rankine's active pressure against the wall and the position of zero pressure

OR

Q6) a) Derive the relation for passive earth pressure using Rankine's theory for dry, [7] cohesionless backfill.

b) Explain Rebhann's graphical method for determination of earth pressure on [6] retaining wall

Q7) a) What is stability number ? Determine the critical height of excavation of a [6] vertical cut in a cohesive soil, if c = 30 kN/m^2 and γ = 18 kN/m^3.

b) Discuss sources and types of ground contamination [7]

OR

Q8) a) State classification of slopes based on different criteria. Explain with neat sketch [7] the different modes of slope failure.

b) Write down the effects of subsurface contamination [6]