Total No. of Questions—**8**] [Total No. of Printed Pages—**4**

Seat No.	

[4657]-505

S.E. (Civil) (First Semester) EXAMINATION, 2014

GEOTECHNICAL ENGINEERING

(2012 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.

1. (*a*) State details of all natural transportation agents for formation of soils and give *one* example of each category. [6]

P.T.O.

(*b*) A sand deposit with specific gravity of 2.65, has bulk density of 19.20 kN/m^3 on the field. Its natural moisture content is 9%. Determine the critical hydraulic gradient of the sand deposit. Take γ_W = 9.81 kN/m^3. [6]

Or

2. (*a*) Define consistency of soils and show the four states of consistency graphically with appropriate consistency limits. [6]

(*b*) With neat sketch explain the procedure of construction of flownet for seepage through earthen dam. [6]

3. (*a*) Explain the procedure for unconfined compression test with neat sketches. [6]

(*b*) Explain the process of field compaction and its control using Proctor needle. [6]

Or

4. (*a*) State and explain the terms involved in Boussinesq's point load and circular load equation for vertical stress determination. [6]

(*b*) Define sensitivity :

A clayey sample when tested in unconfined compression, gave compressive strength of 100 kN/m^2. Specimen of same clay, with same initial condition is subjected to undrained, unconsolidated triaxial test under a cell pressure of 100 kN/m^2. Determine the axial stress in kN/m^2 of failure. [6]

5. (*a*) Determine the relation for lateral earth pressure in active state for submerged cohesionless backfill. [7]

(*b*) Explain step by step procedure for determination of lateral earth pressure graphically by Rehbann's method with neat sketch. [6]

Or

6. (*a*) Define the term lateral earth pressure in passive state.

A wall 8 m high with a smooth vertical back retains dry cohesionless sand with γ = 18 kN/m^3 and ϕ = 30°. Determine the total lateral pressure per metre length of the wall in passive state. [7]

(*b*) Determine the relation for lateral earth pressure in active state for dry and cohesive backfill. [6]

7. (*a*) Explain Taylor's stability number.

Determine the factor of safety for a cohesive soil ($\phi = 0$) 7 m high, if its stability number is known to be 0.156. The slope material has cohesion = 25 kN/m^2 and unit weight 18.5 kN/m^3. [7]

(*b*) State and describe the zones in the contaminated soil strata below the waste dump and how is their extent determined ? [6]

Or

8. (*a*) Discuss the slope stability measures that can be adopted to avoid the occurrence of landslides. [6]

(*b*) What is subsurface contamination ? Discuss the solidification and stabilization method for control of subsurface contamination. [7]