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. 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.
 - Use of calculator is allowed. (iv)
 - (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.

<i>(b)</i>	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 $\gamma_{W} = 9.81 \text{ kN/m}^{3}$. [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]

[4657]-505

(b) Define sensitivity:

A clayey sample when tested in unconfined compression, gave compressive strength of 100 kN/m². Specimen of same clay, with same initial condition is subjected to undrained, unconsolidated triaxial test under a cell pressure of 100 kN/m². Determine the axial stress in kN/m² 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.

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 $\gamma=18$ kN/m³ and $\phi=30^{\circ}$. Determine the total
 - (b) Determine the relation for lateral earth pressure in active state for dry and cohesive backfill. [6]

lateral pressure per metre length of the wall in passive state. [7]

[4657]-505 3 P.T.O.

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/m² and unit weight 18.5 kN/m³.

(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]

[4657]-505