DIPLOMA CIVIL ENGINEERING (DCLEVI) / ADVANCED LEVEL CERTIFICATE IN CIVIL ENGINEERING (ACCLEVI)

Term-End Examination

December, 2013

BICE-024 : SOIL MECHANICS AND FOUNDATION ENGINEERING

Time : 2 hours   *Maximum Marks : 70*

Note : *Attempt **any five** questions. Question No. **1** is **compulsory**. All questions carry **equal** marks.*

Write True (or) False

1. Relative density :   2x7=14

   (a) $R_D ; = \dfrac{e_{max} - e}{e_{max} - e_{min}}$

   (b)   The capillary rise *hc* in a tube of radius *r* is given by $hc = \dfrac{2T \sin \alpha}{r \gamma \omega}$

   (c)   Cohesionless soil also known as $c - \phi$ soils like silts.

   (d)   Factor of safety is 6 which is commonly taken for pile foundation.

   (e)   Vibration compaction is most suitable for black cotton soil.

   (f)   Trial pits is one of the soil Exploration tests.

   (g)   Neutral stress is also known as pore water pressure.

2. (a) Define porosity, void ratio and degree of saturation. **7x2=14**

(b) Explain briefly classification of soils for Engineering use.

3. (a) What is flow net and what are its use. **7x2=14**

(b) How will you do the investigation of soil for a residential building ?

4. Enumerate the types of laboratory test. You would **14** recommend for the following problems :

(a) The stability of a clay foundations.

(b) The stability of a saturated clay footings.

5. Two model tests were made on footings to **14** determine the bearing capacity of a site. The size of the footings and the loads are as follows.

Size of footing   load for 10 mm settlement

0.5 m × 0.5m   3500 kg

1.0 m × 1.0m   11,000 kg

Calculate the size of foundation required for a foundation square in shape to transmit a load of 15,000 kg with 10 mm settlement.

6. (a) State the factors affecting compaction. How density can ba controlled in the field ? **7x2=14**

(b) Distinguish clearly between compaction and consolidation with suitable examples.

7. (a) What are the methods of soil exploration ?

   (b) Explain the concept of field density tests.

   7x2=14

8. Write short notes on **any two** of the following :

   7x2=14

   (a) Behaviour of clayey soils with change in water content.

   (b) Factors affecting permeability of soil.

   (c) Shallow and deep foundations.

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