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BICE-024

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

Term-End Examination

December, 2015

BICE-024 : SOIL MECHANICS AND FOUNDATION ENGINEERING

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any* ***five*** *questions. Question no.* ***1*** *is* ***compulsory****. Use of calculator is allowed.*

1. Choose the correct answer from the following : *7×2=14*

(a) What is the maximum size of plate for plate load test ?

(i) 30 cm square

(ii) 45 cm square

(iii) 60 cm square

(iv) 75 cm square

(b) The field plate load test is the oldest of the methods of determining

(i) Bearing capacity

(ii) Settlement

(iii) Shear strength

(iv) Both (i) and (ii)

(c) According to Indian Standard Code practices, the standard temperature for reporting the specific gravity of soil is

(i) 0°C

(ii) 20°C

(iii) 27°C

(iv) 30°C

(d) Pile foundation are most appropriate for

(i) Compact soil

(ii) Soft rocks

(iii) Water-logged soil

(iv) Multi-storey buildings only

(e) In constructions necessitating deep foundation, the piles are mainly used to

(i) Carry vertical compression load

(ii) Resist uplift load

(iii) Resist horizontal or inclined load

(iv) All the above

(f) The Dutch penetration cone test is related to

(i) Soil profiling

(ii) Derivation of soil properties

(iii) None of the above

(iv) Both (i) and (ii)

(g) Dry density of soil is equal to the

(i) Mass to volume of solids

(ii) Mass to total volume of soil

(iii) Density in dried condition

(iv) None of the above

2. What is meant by co-efficient of permeability ? Mention some common methods of determining co-efficient of permeability and explain any one. *14*

3. Mention the different methods of boring of hole and explain any two methods. *14*

4. (a) What is meant by Atterberg limits ? Explain its practical significance. *7*

(b) Explain the different methods of field identification of soil. *7*

5. (a) A direct shear test, when conducted on a remoulded sample of sand, gave the following observations at the time of failure :

Normal load = 288 N, Shear load = 173 N.

The cross-sectional area of sample = 36 cm^2. *4*

Determine :

(i) Shear stress

(ii) Normal stress

(b) Explain the discrepancies between laboratory and field test in determination of shear strength. *10*

6. Explain the plate load test for determining bearing capacity and also make an assessment on the limitations of the field plate load test. *14*

7. What is meant by load carrying capacity of piles ? Explain the constructional features of pile foundation. *14*

8. Write short notes on any ***four*** of the following : $4 \times 3\frac{1}{2} = 14$

   (a) Behaviour of cohesive soil

   (b) Shape and size of soil particles

   (c) Soil compaction and its necessities

   (d) Darcy's law

   (e) Factors affecting bearing capacity

   (f) Optimum water content