BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – Dip.CE-2022/Dip.CE-2023
Course Name – Geotechnical Engineering
Course Code - DCEPC305
(Semester III)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. Choose the correct alternative from the following :

(i) Select the correct answer for the blank :A soil mass in a three-phase system consists of _____

   a) solids, water and air b) sand, gravel and air
   c) solids and water only d) solids and air only

(ii) Select the correct answer for the blank :The single grained structure is a characteristic of _____

   a) Coarse-grained soil b) Fine-grained soil
   c) None of the mentioned d) All of the mentioned

(iii) Select the correct answer for the blank :The capillary tension or capillary potential can also be called as _____

   a) Pressure deficiency b) Pressure reduction
   c) Negative pressure d) All of the mentioned

(iv) Select the correct answer for the blank : The decrease in the volume of soil mass under stress is known as _____

   a) compression b) compressibility
   c) tension d) consolidation

(v) Select the correct answer for the blank :Every process involving a decrease in the water content of a saturated soil without replacement of water by air is called _____

   a) compression b) compressibility
   c) tension d) consolidation

(vi) Select the correct answer for the blank :The shear deformation of soil in a building can cause _____ of the following.

   a) Sinking of footing b) Slide in an earth embankment
   c) Movement of wedge d) All of the mentioned

(vii) Select the correct answer for the blank :The capillary force of water depends on _____

a) Surface tension of water
b) Pressure in water
c) Conformation of soil pores
d) All of the mentioned

(viii) Choose the correct answer:A grillage foundation_____.

    a) Is provided for heavily loaded isolated columns
    b) Is treated as spread foundation
    c) Consists of two sets of perpendicularly placed steel beams
    d) All of the mentioned

(ix) Choose the correct answer:A clay subjected to pressure in excess to its present over-burden, is said to be _____.

    a) Pre-compressed
    b) Pre-consolidated
    c) Over-consolidated
    d) All of the mentioned

(x) Choose the correct answer:During seepage through a soil, direction of seepage is always _____.

    a) Parallel to equipotential lines
    b) Perpendicular to stream lines
    c) Perpendicular to equipotential lines
    d) None of these

(xi) Choose the correct answer:The seepage force in a soil, is _____.

    a) Perpendicular to the equipotential lines
    b) Proportional to the exit gradient
    c) Proportional to the head loss
    d) All of the mentioned

(xii) Select the correct answer for the blank :The rise of water table below the foundation influences the bearing capacity of soil mainly by reducing _____.

    a) Cohesion and effective angle of shearing resistance
    b) Cohesion and effective unit weight of soil
    c) Effective unit weight of soil and effective angle of shearing resistance
    d) Effective angle of shearing resistance

(xiii) Select the correct answer for the blank :Stoke's law states that the velocity at which a grain settles out of suspension, the other factors remaining constant, is dependent upon _____.

    a) Shape of grain
    b) Weight of grain
    c) Size of grain
    d) Shape, size and weight of grain

(xiv) Select the correct answer for the blank :Water content of soil can _____.

    a) Never be greater than 100 %
    b) Take values only from 0 % to 100 %
    c) Be less than 0 %
    d) Be greater than 100 %

(xv) Select the correct answer for the blank :If the voids of a soil mass are full of air only, the soil is termed as _____.

    a) Air entrained soil
    b) Partially saturated soil
    c) Dry soil
    d) Dehydrated soil

Group-B
(Short Answer Type Questions)
3 x 5=15

2. Define density index. (3)
3. Define Physical weathering. (3)
4. Define phase relations of soils. (3)
5. Explain Disturbed and Undisturbed soil. (3)
6. If G=2.68,w=17% calculate theoretical maximum dry density. (3)

OR

A clay has a liquid limit LL = 60 and a plastic limit PL = 20. Calculate the plasticity index of that clay sample. (3)

Group-C
(Long Answer Type Questions)
5 x 6=30

7. Explain the role of a plasticity chart in soil classification. (5)
8. One cubic metre of wet soil weighs 19.80 kN. If the specific gravity of soil particles is 2.70 and water content is 11%, Calculate the void ratio, dry density and degree of saturation. (5)
9. Explain liquid limit, plastic limit, shrinkage limit. (5)
10. Differentiate between consolidation and compaction. (5)
11. Differentiate between light compaction and Heavy compaction. (5)
12. Distinguish between Silt and Clay. (5)

OR

Distinguish between Aeoline and Sedimentary deposits. (5)

****