1. The unconfined compressive strength of a saturated clay sample is 54 KPa.If a square footing of size 4 m x 4 m is resting on the surface of a deposit of the above clay, the ultimate bearing capacity of the footing (as per Terzaghi's equation) is

    a) 1600 kPa

    b) 315 kPa
    c) 27 kPa
    d) 54 kPa

    Ans:c

2. A plate load test is carried out on a 300 mm × 300 mm plate placed at 2 m below the ground level to determine the bearing capacity of a 2 m × 2 m footing placed at same depth of 2 m on a homogeneous sand deposit extending 10 m below ground. The ground water table is 3m below the ground level. Which of the following factors does not require a correction to the bearing capacity determined based on the load test?

    a) Absence of the overburden pressure during the test
    b) Size of the plate is much smaller than the footing size
    c) Influence of the ground water table
    d) Settlement is recorded only over a limited period of one or two days

    Ans: c

3. A column is supported on a footing of size 1.5m*3.0m located on sand stratum.(Υ=18kN/m3, N_q=24, N_Υ =20)The depth of footing is 1m from ground level.(Given The water table is at a depth of 10m below the base of the footing).The net ultimate bearing capacity (kN/m^2) of the footing based on Terzaghi's bearing capacity equation is

    a) 216
    b) 432
    c) 630
    d) 846

    Ans: c

4. A column is supported on a footing of size 1.5m*3.0m located on sand stratum.(Υ=18kN/m3, N_q=24, N_Υ =20)The depth of footing is 1m from ground level.(Given The water table is at a depth of 10m below the base of the footing). The safe load (kN) that the footing can carry with a factor of safety 3 is

a) 282
b) 648
c) 945
d) 1269

Ans: c

5. The bearing capacity of a rectangular footing of plan dimensions 1.5 m × 3 m resting on the surface of a sand deposit was estimated as 600 kN/m^2 when the water table is far below the base of the footing. The bearing capacities in kN/m^2 when the water level rises to depths of 3 m, 1.5 m and 0.5 m below the base of the footing are
    a) 600, 600, 400
    b) 600, 450, 350
    c) 600, 500, 250
    d) 600, 400, 250

    Ans: a

6. An embankment is to be constructed with a granular soil (bulk unit weight = 20 kN/m^3) on a saturated clayey silt deposit (undrained shear strength = 25 kPa). Assuming undrained general shear failure and bearing capacity factor of 5.7, the maximum height (in m) of the embankment at the point of failure is
    a) 7.1
    b) 5.0
    c) 4.5
    d) 2.5

    Ans: a

7. Likelihood of general shear failure for an isolated footing in sand decreases with
    a) decreasing footing depth
    b) decreasing inter-granular packing of the sand

c) increasing footing width
d) decreasing soil grain compressibility

Ans: b

8. The unconfined compressive strength of a saturated clay sample is 54 KPa. The value of cohension for the clay is
   a) Zero
   b) 13.5 KPa
   c) 27 KPa
   d) 54 KPa

   Ans:c
9. A strip footing is resting on the surface of a purely clayey soil deposit. If the width of the footing is doubled, the ultimate bearing capacity of the soil
   a) becomes double
   b) becomes half
   c) becomes four-times
   d) remains the same

   Ans: d
10. Four columns of a building are to be located within a plot size of 10 m x 10 m. The expected load on each column is 4000 kN. Allowable bearing capacity of the soil deposit is 100 kN/m^2. The type of foundation best suited is
    a) isolated footing
    b) raft foundation
    c) pile foundation
    d) combined footing

    Ans: c