Q 1. On which of the following soils is the standard penetration test useful ?

1. Cohesionless soils 2. Medium clays
3. Gravelly soils 4. Very stiff clays

Select the correct answer using the code given below

(a) 1 only

(b) 1 and 3

(c)1and2

(d) 3 and 4

Q 2. The standard penetration resistance value obtained in a deep deposit of sand at a depth of 6.0 m was 28. The unit weight of sand is 18.0 kN/m^3. What is the corrected value of number of blows for overburden pressure?

(a) 60

(b) 57

(c)59

(d) 55

Q 3. The net ultimate bearing capacity of a purely cohesive soil

(a) **Depends on the width of the footing and is independent of the depth of the footing.**
(b) **Depends on the width as well as the depth of the footing**
(c) **Depends on the depth, but is independent of the width of the footing**
(d) **Is independent of both the width and the depth of the footing**

Q 4. Consider the following statements Increasing width of footing results in

1. **Increase in settlement of A consolidating clay layer**
2. **Increase in bearing capacity of sandy soils**
3. **Decrease in bearing capacity of clays**

Which of the above statements is/are correct?

(A) 1 only

(b) 1 and 2 only

(c) 2 and 3 only

(d) 1, 2 and 3

Q 5 Two footings, one circular and the other square, are founded on the surface of a purely cohesionless soil. The diameter of the circular footing is the same as that of the side of the square footing. The ratio between their ultimate bearing capacities will be

(a) 1.0

(b) 1.3

(c) 1.33

(d) 0.75

Q 6. The mean unconfined compressive strength of a purely cohesive soil was found to be 50 kN/m^2. The ultimate bearing capacity of a square footing calculated by Terzaghi's concept (bearing capacity factor N_c = 5.7) will be

(a) 185.25 kN /m^2

(b) 390.5 kN /m^2

(c) 285 kN /m^2

(d) 142.5 kN /m^2

Q 7.

Statement (I)

Foundations may not be geometrically categorized as shallow, or deep, foundations.

Statement (II)
A foundation is shallow if its depth is equal to or less than its width; otherwise it is deep.

Q 8. The gross bearing capacity of a footing is 450 kN/m^2. If the footing is 1.5 m wide and is at a depth of 1 m in a clayey soil which has a unit weight of 20 kN/m^3, then the net bearing capacity is

(a) 410 kN/m^2

(b) 420 kN/m^2

(c) 430 kN/m^2

(d) 440 kN/m^2

Q 9. Consider the following statements:

1. **The ultimate bearing capacity of a footing on sand increases with an increase in its width.**
2. **The settlement of the footing on sand increases with increase in its width.**

Which of the above statements are correct?

(a) 1 only

(b) Both 1 and 2

(c) 2 only

(d) Neither 1 nor 2

Q 10. Consider the following statements:

1. **The proportioning of footing in sand is more often governed by settlement rather than by bearing capacity.**
2. **The pressure bulb profiles under a strip footing form as co-axially imaginable bulbs under its length**
3. **Friction piles are also called 'floating piles**

Which of the above statements are correct?

(a) 1, 2 and 3

(b) 1 and 2 only

(c) 1 and 3 only

(d) 2 and 3 only

Q 11. Two circular footings of diameters 01 and 02 are resting on the surface of purely cohesive soil. The ratio °$_1$/°$_2$ = 2. If the ultimate load carrying capacity of the footing of diameter 01 is 200 'kN/m^2, then the ultimate bearing capacity (in kN/m2) of the footing of diameter 02 will be

(a) 100

(b) 200

(c) 314

(d) 571

Q 12. Which one of the following is the correct statement?

The contact pressure distribution below rigid footing on the surface of a clayey soil is

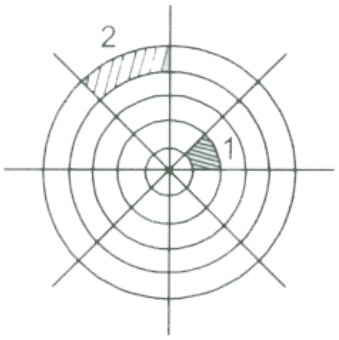
(a) Uniform for the full width

(b) Maximum at the centre and minimum at the edges.

(c) Maximum at the edges and minimum at the centre

(d) Of an irregular shape.

Q 13. Standard Newmark's influence chart is shown in the given figure. If loaded equally the areas marked 1 and 2 will yield pressures at the centre such that



(a) 1 yield more than 2

(b) 2 yield more than 1

(c) 1 and 2 yield the same

(d) 1 yield exactly half of that of 2

Q 14. For a vertical concentrated load acting on the surface of a semi inifinite elastic soil mass, vertical normal stress at depth z is proportional to

(a) z

(b) 1/z

(c) Z2

(d) 1/z^2

Q 15. In the case of stratified soil layers, the best equation that can be adopted for computing the pressure distribution is

(a) Prandtl's

(b) Skempton's

(c) Westergaard's

(d) Boussinesq's

Q 16. Stresses obtained from Boussinesq's theory are considered reasonably satisfactory in foundation engineering because

(a) They represent stress distribution in homogenous soil below loaded area
(b) They account for anisotropy of soil property
(c) They give due regard to plastic behaviour of soils, particularly for settlement analysis
(d) They consider elastic soil medium, and the intensity of allowable stresses below foundation in most cases are quite small and justify elastic solutions

Q 17. Westergaard's formula for vertical stress gives greater value of stress than that by the Boussinesq's formula, when r/z exceeds:

(a) 1.5

(b) 2.5

(c)3.5

(d) 4.0

Q 18. A line load of infinite length has an intensity q per unit length. What is the vertical stress O"z at a depth z below the earth at the centre of the load?

A. $\sigma_z = \frac{2qz}{\pi}$

B. $\sigma_z = \frac{2qz}{\pi z}$

C. $\sigma_z = \frac{2qz^2}{\pi}$

D. $\sigma_z = \frac{2qz}{\pi^2}$

Q 19. An isobar is a line which connects all points below the ground surface at which

(a) The local ground elevation is same

(b) The settlement is same

(c) The vertical stress is the same

(d) The ground elevation is varying