01. Which one of the following, gives the correct decreasing order of the densities of a soil sample

a. Saturated, submerged, wet, dry
b. Saturated, wet submerged, dry
c. Saturated, wet, dry, submerged
d. Wet, saturated, submerged, dry

02. For sampling saturated sands and other soft and wet soils satisfactorily, the most suitable soil sampler is

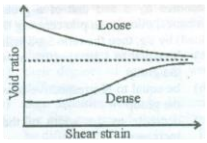
a. Open drive thin-walled tube sampler
b. Standard split-spoon sampler
c. Stationary piston sampler
d. Rotary sampler

03. Match List I and List II and select the correct answer using the codes given below the lists:

List I (Condition under which it is suited)	List II (type of foundation)
A. when structural load is uniform and soil is soft clay, made up of marshy land	1. footings
B. When structural load is heavy and or soil having low bearing capacity for a considerable depth	2. piles
C. when soil is having good bearing capacity at shallow depth and structural load is within permissible limit	3. raft
D. when structural load of bridge is to be transferred through sandy soil to bed rock	4. wells or pier

a. A-1 B-2 C-3 D-4
b. A-3 B-2 C-4 D-1
c. A-1 B-4 C-2 D-3
d. A-3 B-2 C-1 D-4

04. Figure 8.7 shows the relation between void ratio and shear strain for a sand under two density conditions. The void ratio corresponding to the dashed line is called.



a. Optimum void ratio
b. Critical void ratio
c. Residual void ratio
d. Undisturbed void ratio

05. A vane shear test on a soil sample gives moment of total resistance M. the shear stress failure, 'S' being more or less uniform at top, bottom and surface of cylinder of soil is given by (where H = height of vane, D= diameter of vane)

a. $s = \frac{2M}{\pi D^2 H}$ b. $S = \frac{2M}{\pi D^2 (H+D)}$

c. $S = \frac{2M}{\pi D^2 \left(H + \frac{D}{3}\right)}$ d. $S = \frac{2M}{\pi DH}$

06. The following refer to the stability analysis of an earth dam under different conditions:

1. Stability of D/S slope during steady seepage

2. Stability of U/S slope during sudden drawdown

3. Stability of U/S and D/S slope during construction of these statements.

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. 1, 2 and 3 are correct

07. If the settlement of a single pile in sand is denoted by S and that of a group of N identical piles (each pile carrying the same load) by Sg, then the ratio Sg/S will

a. Be equal to 1 irrespective of width of the group
b. Be equal to N irrespective of width of the group
c. Decreases as the width of the group increases
d. Increases as the width of the group increases.

08. Match List I and List II containing terms related to vibration of damped single degree-of-freedom foundation system and select the correct answer the codes given below the lists:

List I	List II
A. critical damping coefficient	1. $\frac{2\pi D}{\sqrt{1-D^2}}$
B. Damped circular frequency	2. $\frac{\pi D^2}{\sqrt{1-D^2}}$
C. Logarithmic decrement	3. $\sqrt{\frac{k}{m}}$
	4. $2\sqrt{km}$
	5. $\omega_n\sqrt{1-D^2}$
	6. $\frac{\omega_n}{D}$

a. A-3 B-5 C-1
b. A-3 B-6 C-2
c. A-4 B-5 C-1
d. A-4 B-6 C-2

09. Match list I with List II and select the correct answer using the codes given below the lists:

List I (Field test)	List II (Useful for)
A. Vane shear test	1. End bearing and skin friction resistance
B. Standard penetration test	2. In-situ stress-strain
C. Static cone penetration test	3. Soft clay
D. Pressure meter test	4. Sandy deposits

a. A-4 B-2 C-1 D-3
b. A-3 B-4 C-1 D-2
c. A-4 B-3 C-2 D-1
d. A-3 B-4 C-2 D-1

10. Consider the following statements regarding settlement of foundations:

1. Differential settlement of foundation leads to structural damage to the superstructure.

2. In non-cohesive soils the major components of settlement is due to consolidation.

3. Lowering of ground water table contributes to settlement of foundations. Of these statements.

a. 1 and 2 are correct
b. 1 and 3 are correct
c. 2 and 3 are correct
d. 1, 2 and 3 are correct

11. Consider the following types of soil tests:

1. California bearing ratio
2. Consolidation
3. Unconfined compression

The soil required to be done in the case of undisturbed sample include

a. 1, 2 and 3
b. 1 and 2
c. 1 and 3
d. 2 and 3

12. Boring method is to be chose depending upon the type of exploratory strata. In this context, match List I with List II and select the correct answer using the codes given below the lists:

List I	List II
A. Auger boring	1. Partly saturated sands, silts and medium to stiff cohesive soils
B. Wash boring	2. All types of soils and rocks except in stony or porous soils and fissured rocks
C. Percussion drilling	3. Practically all types of soils except hard and cemented soil or rock
D. Rotary drilling	4. All types of soils and rocks. difficult in loose sands and soft sticky clays

a. A-1 B-4 C-3 D-2
b. A-1 B-3 C-4 D-2
c. A-2 B-4 C-3 D-1
d. A-2 B-3 C-4 D-1

13. Consider the following statements; clay which exhibit high activity

1. Contain montmorillonite.
2. Contain kaolinite
3. Have a high silt content.
4. Have a high plasticity index.
5. have a low plasticity index.

of these statements.

a. 1, 3 and 5 are correct
b. 2, 3 and 5 are correct
c. 2 and 4 are correct
d. 1 and 4 are correct

14. A sample of clay and a sample of sand have the same specific gravity and void ratio. Their permeabilities would differ because.

a. Their porosities would be different
b. Their degrees of saturation would be different
c. Their densities would be different
d. The size ranges of their voids would be different

15. During seepage through an earth mass, the direction of seepage is

a. Parallel to the equipotential lines
b. Perpendicular to the stream lines
c. Perpendicular to the equipotential lines
d. Along the direction of gravity

16. Consider the following limitations:

1. Can be performed only on purely cohesionless soils

2. Plane of failure is predetermined

3. There is virtually no control on drainage

4. Non-uniform distribution of stresses

5. Principal stresses in the sample cannot be determined

The limitation inherent in direct shear test include

a. 1, 2 and 3
b. 2, 3 and 4
c. 3, 4 and 5
d. 1, 2 and 5

17. Consider the following assumptions:

1. Failure occurs on a plane surface

2. Wall is smooth but not necessarily vertical

3. Failure wedge is a rigid body.

Coulomb's theory of earth pressure is based on assumptions

a. 1, 2 and 3
b. 1 and 2
c. 1 and 3
d. 2 and 3

18. In a saturated clay layer undergoing consolidation with single drainage at its top, the pore water pressure would be the maximum at its.

a. Top
b. Middle
c. Bottom
d. Top as well as the bottom

19. A saturated clay stratum of thickness 10 m, bounded on top and bottom by medium coarse sand layers, has a coefficient of consolidation of 0.002 cm^2/s. if this stratum is would undergo 50% of its primary consolidation in

a. 1136 days
b. 227 days
c. 284 days
d. 568 days

20. The stress distribution at a depth beneath a loaded area is determined using newmark's influence chart which indicate an influence value of 0.005. the number of the segments covered by the loaded area in the chart is 20 and the intensity of loading on the area is 10 T/m the intensity of stress dist

a. 1 T/m^2
b. 2 T/m^2
c. 5 T/m^2
d. 10 T/m^2