01. The upstream slope of an earth dam under steady seepage condition is

a. Equipotential line
b. Phreatic line
c. Flow-line
d. Seepage line

02. Consider the following statements related to triaxial test

1. Failure occurs along pre-determined plane.
2. Intermediate and minor principal stresses are equal.
3. Volume changes can be measured
4. Field conditions can be simulated of these statements.

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

03. A vane 20cm long and 10 cm in diameter was pressed into a soft marine clay at the bottom of a bore hole. Torque was applied gradually and failure occurred at 1000 kg cm. the cohesion of the clay in kg/cm² is

a. $\frac{1}{\pi} * \frac{6}{7}$
b. $\frac{1}{\pi} * \frac{5}{7}$
c. $\frac{1}{\pi} * \frac{4}{7}$
d. $\frac{1}{\pi} * \frac{3}{7}$

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

list II	List II
A. Active pressure	1. Wall moves
B. Passive pressure	2. No movement of wall
C. Earth pressure at rest	3. wall moves away from backfill

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

05. A cohesionless soil having an angle of shearing resistance of ϕ is standing at a slope angle of 1 the factor of safety of the slope is

a. $\frac{tan\, i}{tan\Phi}$
b. Tan i- tan ϕ
c. $\frac{tan\Phi}{tan\, i}$
d. Tan ϕ-tan i

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

List I (Cause)	List II (Effect)
A. Water present in the soil above water table	1. Increases in effective stress
B. Upward seepage flow	2. No change in effective stress
C. Downward seepage flow	3. Water is in a state of tension
D. Fluctuation of water level above ground level	4. Decrease in effective stress

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

07. In consolidation testing, curve fitting method is used to determine

a. Compression index
b. Swelling index
c. Coefficient of consolidation
d. Time factor

08. Westergaard's analysis for stress distribution beneath loaded areas is applicable to

a. Sandy soils
b. Clayey soils
c. Stratified soils
d. Silty soils

09. Consider the following characteristics of soils layer:

1. Poisson's ratio
2. Young's modulus
3. Finite natural of soils layer
4. Effect of water table
5. Rigidity of footing Westergaard's analysis for pressure distribution in soils ultilises

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

10. A square footing is to be proportioned on a cohesionless soil with an average N value of 40. the allowable bearing pressure of this footing will be governed by

a. General shear failure
b. Local shear failure
c. Progressive failure
d. Settlement criteria

11. According to skempton's formula for a surface footing of square shape, the net ultimate bearing capacity on a purely cohesive soil of cohesion c is

a. 1.4 c
b. 6.0 c
c. 7.4 c
d. 9.0 c

12. Undisturbed soil sample are required for conducting

a. Hydrometer test
b. Shrinkage limit test
c. Consolidation test
d. Specific gravity test

13. Soil pressure distribution below a rigid footing on the surface of a cohesive soil is

a. Maximum at the centre and minimum at edges
b. Minimum at the centre and maximum at edges
c. Uniform throughout
d. Maximum at one end and minimum at the other end

14. Compression index on a soil helps to determine

a. Total time required for consolidation
b. Time required for 50 percent consolidation
c. Total settlement of clay layer
d. Pre-consolidation pressure of clay

15. When the degree of consolidation is 50% the time factor is about

a. 0.2
b. 0.5
c. 1.0
d. 2.0

16. According to bousinesq's theory the vertical stress at a point in a semi-infinite soil mass depends upon

a. Point load, coordinates of the point and modulus of elasticity of soil
b. Point load, coordinates of the point, modulus of elasticity of soil and its poisson's ratio
c. Point load and coordinates of the point
d. Point load, coordinates of the point modulus of elasticity of soil and its density

17. The process by which a mass of saturated soil is caused by external forces to suddenly lose its shear strength and to behave as a fluid is called

a. Piping
b. Slide
c. Quick condition
d. liquefaction

18. By using sieve analysis, the particle size distribution curve has been plotted for a particular soil. The coefficient of curvature C_c is given by

a. $\frac{D_{30}}{D^{30}*D^{10}}$

b. $\frac{\sqrt{D_{30}}}{D_{60}*D_{10}}$

c. $\frac{D_{30}}{\sqrt{D_{60}*D_{10}}}$

d. $\frac{D_{30}^2}{D_{60}*D_{10}}$

19. Given below are method of compaction.
1. Vibration technique
2. Flooding the soil
3. Sheep-foot roller
4. Tandem roller
5. Heavy weights dropped from a height the methods suitable for cohesionless soils include

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

20. Consider the following factor pertaining to flow through soil
1. Hydraulic gradient
2. grain size
3. Void ratio
4. Cross-sectional area of the sample of these, the factor affecting permeability include

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