

142/2015

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Black cotton soils have :
(A) High Plasticity (B) Low plasticity
(C) Good shear strength (D) Highly incompressible
2. The term 'Drift' in soil formation relates to :
(A) Deposits made by glaciers
(B) Deposits formed by melting of glaciers
(C) Lateral movement of soil
(D) Fissures formed in lateritic rocks
3. Degree of saturation of soil refers to :
(A) Ratio of the volume of voids to the volume of soil
(B) Ratio of the volume of water to the volume of voids
(C) Ratio of the volume of water to the volume of soil
(D) Ratio of weight of water to the weight of solids
4. For a soil with specific gravity 2.6 and dry unit weight of 20 KN/m^3 (unit weight of water = 10 KN/m^3) the void ratio will be :
(A) 0.7 (B) 0.52
(C) 0.769 (D) 0.3
5. If 60% of a soil sample is finer than 0.06 mm and 10% of it is finer than 0.004 mm, its uniformity coefficient will be :
(A) 0.0667 (B) 1.5
(C) 15 (D) 0.00024
6. A soil with a consistency index of zero indicates that :
(A) Soil is at the liquid limit (B) Soil attained its plastic limit
(C) Soil is hard (D) Soil has good shear strength
7. If the effective grain size of a soil is 0.2 mm and Allen Hazen's C is 15, its coefficient of permeability is :
(A) 0.30 mm/sec (B) 0.60 mm/sec
(C) 0.3 cm/sec (D) 0.6 cm/sec

8. The normal stress and shear stress on a failure plane in a drained test on a cohesion less soil are 1.0 kg/cm^2 each, the angle that the failure plane makes with the major principal plane will be :
- (A) 90° (B) 45°
 (C) 22.5° (D) 67.5°
9. Which of the following statement is wrong?
- (A) In cantilever retaining walls, the stem acts as a vertical cantilever; whereas in counterfort retaining walls it act as a continuous slab
 (B) Weep holes are provided in the retaining walls to reduce the development of excessive lateral pressure on the walls
 (C) Fine graded soils are usually recommended as a backfill material as it reduces the earth pressure against retaining walls
 (D) The basic difference between counterfort and cantilever retaining walls is in the calculation of bending moment and shear force
10. Which of the following statements is TRUE?
- (A) The depth of exploration required at a particular site is mainly governed by the depth of the influencing zone
 (B) Auger bring is recommended where depth of sampling is high
 (C) Wash boring is suitable for obtaining undisturbed samples above water table level
 (D) Undisturbed soil samples are used to determine the index properties of soil like grain size, plasticity characteristics etc
11. 'The maximum rate at which a soil in any given condition is capable of absorbing water' is termed as :
- (A) Infiltration rate (B) Infiltration capacity
 (C) Absorption capacity (D) Sorption rate
12. 'Capillary fringe' refers to :
- (A) Zone just above the water table where moisture content is maintained by capillarity
 (B) Zone just below the water table where moisture content is maintained by percolation
 (C) Zone below the soil moisture zone
 (D) Zone just below the sub-surface where moisture content is maintained by infiltration
13. The plotting of linear form of standard infiltration capacity curve represents a straight line with a slope equal to :
- (A) $-1/[K \log_{10} e]$ (B) $1/[K \log_{10} e]$
 (C) $K/[\log_{10} e]$ (D) $-K/[\log_{10} e]$