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Q : 1) Water content of a soil sample is the difference of the weight of the given sample at the given temperature and the weight determined after drying it for 24 hours at temperature ranging from _____.

A : 80° to 90°C

B : 90° to 95°C

C : 95° to 100°C

D : 105° to 110°C

Q : 2) If the voids of a soil are completely filled with air, then it is called _____

A : Dry soil

B : Partially saturated soil

C : Submerged soil

D : Saturated soil

Q : 3) Which one of the following represents the measure of partice size range?

A : Slope of gradation curve of soil

B : Coefficient of uniformity

C : Fineness of the soil

D : Relative index

Q : 4) Which of the following represents the percentage limit of porosity of the compacted sand?

A : 5% to 15%

B : 15% to 30%

C : 30% to 40%

D : 40% to 50%

Q : 5) The grain size (mm) of medium grained sand lies between _____.

A : 0.425 to 0.075

B : 2.0 to 0.425

C : 4.75 to 2.0

D : 20 to 4.75

Q : 6) Which of the following represents the range of plasticity index for silt?

A : 10 to 15

B : 15 to 25

C : 25 to 35

D : 35 to 45

Q : 7) If a grading curve is horizontal between the portion of 20 mm I.S. sieve and 4.75 mm I.S. sieve, the graded aggregate do not contain.

A : 20 mm particles

B : 10 mm particles

C : 4.75 mm particles

D : All option are correct

Q : 8) The volume and weight of air, water and solids in a soil mass are given in the table.

Constituent	Volume (cm^3)	Weight (g)
Air	0.2	0
Water	0.3	0.3
Solids	0.5	1.0

Consider the following statements (S1 to S4) with respect to the table.

S1: Soil is partially saturated with degree of saturation = 60%

S2: Void ratio = 40%

S3: Water content = 30%

S4: Saturated unit weight = 1.5 g/cm^3

Which of the statements is correct?

A : S1, S2 and S4 B : S2, S3 and S4

C : S1, S2 and S3 D : S1, S3 and S4

Q : 9) Which of the following methdos is used to find the specific gravity of soil in a laboratory?

A : Hydrometer analysis

B : Sand bath method

C : Radiation method

D : Pycnometer method

Q : 10) What is the capacity of density bottle used generally for determination of specific gravity of fine grained soil in the laboratory as per IS 2720 (Part 3/sec-1)-1980?

A : 20 ml

B : 150 ml

C : 50 ml

D : 100 ml

Q : 11) A unit phase diagram is normally divided into three parts. What does the top, middle and bottom part represent?

A : Solid, water and air respectively

B : Water, air and solid respectively

C : Air, water and solid respectively

D : Air, solid and water respectively

Q : 12) The limit of water content at which soil tends to pass from semi solid state to the solid state is called:

A : Saturation limit

B : Liquid limit

C : Plastic limit

D : Shrinkage limit

Q : 13) Out of the cohesion limit, sticky limit, liquid limit, plastic limit and shrinkage limit, the most important in engineering practices are:

A : Cohesion limit, plastic limit, shrinkage limit and sticky limit

B : Liquid limit, plastic limit, shrinkage limit

C : Plastic limit, shrinkage limit and cohesion limit

D : Cohesion limit, plastic limit and liquid limit

Q : 14) Identify the method that is NOT used for determination of in situ unit weight of a natural soil deposit?

A : Core cutter method

B : Sand bath method

C : Water displacement method

D : Sand replacement method

Q : 15) The coefficient of gradation and the coefficient of uniformity of a given soil sample is 1.0 and 4.0 respectively. The ratio of effective size to the diameter through which 30% of the total mass is passed is _____.

A : 1.25

B : 1.5

C : 1.75

D : 2

Q : 16) Which of the following shows the correct order of increasing surface areas of the given soil?

A : Clay < Silt < Sand < Colloids

B : Gravel < Silt < Colloids < Clay

C : Sand < Silt < Clay < Colloids

D : Silt < gravel < Colloids < Clay

Q : 17) On a grading curve, the gap grading is represented by

A : Horizontal line

B : A vertical line

C : North west inclined line

D : None of these

Q : 18) The diameter of the sieve used for finding liquid limit is _____.

A : 125 microns

B : 425 microns

C : 250 microns

D : 375 microns

Q : 19) The unifield soil classification system was originally developed by _____.

A : Atterberg

B : Casagrande

C : Terzaghi

D : Mohr

Q : 20) The ratio of compressive strength of material saturated with water to that in dry state is known as:

A : Coefficient of thixotropy

B : Coefficient of softening

C : Coefficient of compressibility

D : Coefficient of hardness

Q : 21) If D_{10}, D_{30} and D_{60} represent particle sizes in millimeter, then the correct expression for coefficient of curvature (C_c) from a particle size distribution curve is given by

A : $\frac{[D_{30}]^2}{D_{10} \times D_{60}}$

B : $\frac{[D_{60}]^2}{D_{10} \times D_{30}}$

C : $\frac{D_{30}}{D_{10}}$

D : $\frac{D_{60}}{D_{10}}$

Q : 22) Sand particles are made of:

A : Kaolinite

B : Illite

C : Montmorillonite

D : Quartz

Q : 23) Which of the following is NOT correct about the effects of compaction of soil?

A : Compaction increases shear and bearing strength of soil.

B : Compaction decreases the tendency for settlement of soil.

C : Compaction increase the permeability of soil.

D : Compaction increases the frictional characteristics of soil.

Q : 24) The degree of compaction of a soil is characterized by its:

A : Consistency

B : Compressibility

C : Saturated unit weight

D : Dry density

Q : 25) Which of the following is a method used in a field to determine the permeability of soil?

A : Pumping out of well method

B : Oedometer test

C : Constant head permeameter method

D : Falling head permeameter method

Q : 26) Which of the following factors does NOT affect permeability of soil?

A : Properties of pore fluid

B : Grain size of soil particles

C : Void ratio

D : Volume of soil

Q : 27) Consider different types of soils i.e. Fine sand (F), Homogeneous clay (C), Coarse gravel (G), silty clays (S). Arrange the soils in the increasing order of their permeability (low to high values).

A : C, F, S, G

B : S, C, F, G

C : C, S, F, G

D : S, C, G, F

Q : 28) In the flow over length of 50m, the head loss of 6m occurred due to seepage. The hydraulic gradient is given by _____.

A : 0.01

B : 0.12

C : 0.29

D : 0.32

Q : 29) If the void ratio and discharge velocity for soil is 0.5 and 6×10^{-7} m/s respectively, what is the value of seepage velocity (m/s)?

A : 3×10^{-7}

B : 6×10^{-7}

C : 12×10^{-7}

D : 18×10^{-7}

Q : 30) According to Terzaghi and peck the ratio of D15 size of filter material to the D85 size of the base material should be:

A : < 10

B : < 15

C : < 4

D : < 25

Q : 31) The unit of the coefficient of consolidation is:

A : cm^2/gm

B : cm^2/sec

C : $gm/cm^2/sec$

D : gm-cm/sec

Q : 32) The pore water pressure in the soil sample of consolidometer test is _____.

A : Maximum at bottom

B : Maximum at centre

C : Maximum at top

D : Minimum at center

Q : 33) Piston and spring analogy method was demonstrated by Terzaghi for which of the following processes?

A : Soil particle gradation

B : Consolidation

C : Permeability

D : Compaction

Q : 34) A normally consolidated clay layer settled by 20 mm when the effective stress was increased from 25 to 50 kN/m^2. What will be the settlement when the effective stress is increased from 50 to 100 kN/m^2?

A : 40 mm

B : 10 mm

C : 5 mm

D : 20 mm

Q : 35) In triaxial compression test on a soil specimen, the intermediate principle stress is equal to

A : Major principal stress

B : Minor principal stress

C : Difference between major and minor principal stress

D : None of these

Q : 36) Vane shear test is used to find out shear strength of:

A : Sandy soil

B : Gravelly soil

C : Clayey soil

D : All options are correct

Q : 37) The shear strength in plastic undrained clay, is due to

A : Inter-granular friction

B : Internal friction

C : Cohesion

D : None of these

Q : 38) Which of the following parameter is determined by triaxial test?

A : Hydraulic gradient

B : Permeability

C : Shear strength parameters

D : Grain size

Q : 39) The actual movement of soil mass is known as:

A : Collapse

B : Slope failure

C : Surface failure

D : Base failure

Q : 40) The unconfined strength of three types of cohesive soil : Soil A, soil B and Soil C are 35 kN/m^2, 450 kN/m^2 and 140 kN/m^2 respectively. Identify the correct statement based on the consistency behaviour of soils.

A : Soil A is categorized as stiff, soil B is categorized as hand and soil C is categorized soft

B : Soil A is categorized as soft, soil B is categorized as hard and soil C is categorized as stiff.

C : Soil A is categorized as soft, soil B is caterosied as stiff and soil C is categorized as hard.

D : Soil A is categorized as Hard, soil B is categorized as stiff and soil C is categorized as soft.

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