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**Q : 1) Which one in the following list does not possess plasticity?**

**A : Bentonite**

**B : Kaolinite**

**C : Rock flour**

**D : Fat clay**

**Q : 2) The methods of slices is applicable to:**

**A : Stratified soils**

**B : Homogeneous soils**

**C : Saturated soils**

**D : None of these**



**Q : 3) Which of the following types of soil is not wind-below deposit?**

**A : Drift**

**B : Loess**

**C : Dune sand**

**D : Aeolian deposits**

**Q : 4) Match List-I with List-II and select the correct answer using the codes given below the lists:**

List-I (soil type)	List-II (Characteristic)
A. Oolitic sand	1. Under-consolidated
B. Biogenetic sand	2. Rounded
C. Calcareous clay	3. Cemented
D. Soft clay	4. Crushing

**Codes:**

**A : 2, 4, 3, 1**

**B : 2, 1, 3, 4**

**C : 2, 1, 4, 3**

**D : 2, 3, 4, 1**



**Q : 5) Sedimentary deposits consisting of alternate thin layers of silt and clay are called as-**

**A : Dispersive clays**

**B : Expansive clays**

**C : Calcareous clays**

**D : Varved clays**

**Q : 6) The branch of geology which deals with various aspects of rocks is called**

**A : Lithology**

**B : Mineralogy**

**C : Petrology**

**D : Rockology**



**Q : 7) Identify the true statements from the following:**

**A : Lateritic soil is a category of organic soil**

**B : Water held firmly to the clay particles has the same properties as ordinary water**

**C : A soil transported by gravitational force is called talus**

**D : A clay deposit which exhibits no evidence of fissuring is described as intact**

**Q : 8) Estimate the theoretical height of capillary rise in a fine grained soil with effective size of 0.02 mm, and void ratio 0.5. Use Terzaghi and peck relation. Take the empirical constant as  $0.3 \text{ cm}^2$ .**

**A : 0.3 m**

**B : 1.2 m**

**C : 3 m**

**D : 0.6 m**

**Q : 9) The texture of sand stone is-**

**A : Porphyritic**

**B : Conglomerate**

**C : Vesicular**

**D : Clastic**



**Q : 10) Drilling mud is usually a mixture of**

**A : Bentonite clay and water**

**B : China clay and water**

**C : Fine silt, fine sand and water**

**D : Fine silt and water**

**Q : 11) Which of the following is a deposit of glacial origin consisting of unassorted mixture of boulders and clay particles?**

**A : Loess**

**B : Talus**

**C : Till**

**D : Eskers**

**Q : 12) Consider the following statements:**

- 1. Illite is the mineral largely responsible for the swelling and shrinkage behaviour of clayey soils.**
- 2. A differential free swell value of 55% indicates a soil with low degree of expansiveness.**
- 3. Higher the plasticity index of a soil greater its swelling potential.**
- 4. A low shrinkage limit of a soil indicates possibility of swelling at low water content.**

**Which of the above statements are correct?**

**A : 1 and 2**

**B : 2 and 3 only**

**C : 1 and 4 only**

**D : 3 and 4 only**



**Q : 13) The behaviour of sand mass to cause liquefaction during an earthquake largely depends on**

**A : Number of stress cycles**

**B : amplitude of earthquake**

**C : Angle of internal friction of sand**

**D : Relative density of sand**

**Q : 14) Work out theoretical maximum dry density for a soil sample having a specific gravity of 2.7 and optimum moisture content of 19 percent.**

**A :  $3.48/\text{cm}^3$**

**B :  $6.43 \text{ g}/\text{cm}^3$**

**C :  $3.558 \text{ g}/\text{cm}^3$**

**D :  $1.7845 \text{ g}/\text{cm}^3$**

**Q : 15) Which 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**



**Q : 16) In soil, the value of which of the following can be more than 100%?**

- (i) Air content**
- (ii) Water content**
- (iii) Void ratio**
- (iv) Porosity**

**A : Only (i)**

**B : (i) and (ii)**

**C : (ii) and (iii)**

**D : (ii), (iii) and (iv)**

**Q : 17) How many cubic metres of soil having void ratio of 0.7 can be made from  $30\text{m}^3$  of soil with void ratio of 1.2?**

**A :  $36.6\text{ m}^3$**

**B :  $30.0\text{ m}^3$**

**C :  $25.9\text{ m}^3$**

**D :  $23.2\text{ m}^3$**

**Q : 18) The difference between maximum void ratio and minimum void ratio of a sand sample is 0.25. If relative density of this sample is 60% at a void ratio of 0.40, then the void ratio of this sample at its loosest state will be**

**A : 0.40**

**B : 0.75**

**C : 0.70**

**D : 0.55**



**Q : 19) When the natural state of the cohesionless soil is in its loosest form then the relative density will be equal to**

**A : One**

**B : Zero**

**C : Two**

**D : Less than one**

**Q : 20) Inverse of relative density of soil is:**

**A :**  $\frac{e_{max} - e_{nat}}{e_{max} - e_{min}} \times 100\%$

**B :**  $\frac{e_{max} - e_{min}}{e_{max} - e_{nat}} \times 100\%$

**C :**  $\frac{e_{nat} - e_{max}}{e_{max} - e_{min}} \times 100\%$

**D :**  $\frac{e_{max} - e_{min}}{e_{nat} - e_{max}} \times 100\%$

**Q : 21) A dry soil has mass specific gravity of 1.35. If the specific gravity of solids is 2.7, then the void ratio will be**

**A : 0.5**

**B : 1.0**

**C : 1.5**

**D : 2.0**

**Q : 22) The relative density of a soil is equal:**

**A :**  $\frac{\rho_{max} - \rho_{min}}{\rho_{max} - \rho} \times 100\%$

**B :**  $\frac{\rho - \rho_{min}}{\rho_{max} - \rho_{min}} \times 100\%$

**C :**  $\frac{\rho_{max}}{\rho} \times \left( \frac{\rho - \rho_{min}}{\rho_{max} - \rho_{min}} \right) \times 100\%$

**D :**  $\frac{\rho_{max} + \rho}{\rho_{max} - \rho_{min}} \times 100\%$



**Q : 23) For sand of uniform spherical particles, the ratio of voids ratio in the loosest and the densest states is**

**A : 2.6**

**B : 3.5**

**C : 4.6**

**D : 3.0**

**Q : 24) A soil having particles of approximately the same size is known as**

**A : Well graded**

**B : Poorly graded**

**C : Uniformly graded**

**D : Gap graded**

**Q : 25) Expressed as percentage of the dry volume, to the corresponding change in water content is called**

**A : Specific gravity of soil solids**

**B : Mass-specific gravity of soils**

**C : Shrinkage ratio of soils**

**D : Density ratio of soils**

**Q : 26) The particle size distribution curve with steep slope indicates that the type of soil is**

**A : Well graded soil**

**B : Gap graded soil**

**C : Uniform size soil**

**D : None of the above**



**Q : 27) A geotechnical engineer tests a soil and find that its liquidity index is 1.2. Which of the following states is the soil in?**

**A : At liquid limit**

**B : At plastic limit**

**C : In liquid state**

**D : In over dry state**

**Q : 28) The most accurate method of determining the water content in a sample of soil is:**

**A : Sand bath method**

**B : Calcium carbide method**

**C : Over drying method**

**D : Alcohol method**

**Q : 29) The gain in strength of soil with passage of time after it has been remoulded is known as:**

**A : Plasticity**

**B : Sensitivity**

**C : Activity**

**D : Thixotropy**

**Q : 30) Toughness index is defined as the ratio of :**

**A : Plasticity index to consistency index**

**B : Consistency index to liquidity index**

**C : Plasticity index to flow index**

**D : Liquidity index to flow index**



**Q : 31) Liquid limit test is performed on soil samples passing through IS sieve of size**

**A : 25  $\mu$**

**B : 2 mm**

**C : 425  $\mu$**

**D : 250  $\mu$**

**Q : 32) The water content of soil which represents the boundary between plastic state and liquid state is known as**

**A : Liquid limit**

**B : Plastic limit**

**C : Shrinkage limit**

**D : Plasticity index**

**Q : 33) An oven dried soil mass of 200 gm is placed in pycnometer and completely filled with water. Combined mass of bottle, soil and water is 1605 gm. Calculate specific gravity of soil if pycnometer with water alone has weight of 1480 gm-**

**A : 2.63**

**B : 2.65**

**C : 2.67**

**D : 2.69**

**Q : 34) The minimum water content at which a soil just begins to crumble, when rolled into threads 3 mm in diameter is known as the :**

**A : shrinkage limit**

**B : Plastic limit**

**C : Consistency limit**

**D : Liquid limit**



**Q : 35) In hydrometer analysis for a soil mass**

**A : Both meniscus correction and dispersing agent correction are additive**

**B : Both meniscus correction and dispersing agent correction are subtractive**

**C : Meniscus correction is additive and dispersing agent correction is subtractive**

**D : Meniscus correction is subtractive and dispersing agent correction is additive**

**Q : 36) If the consistency index of a soil sample is equal to unity, it is as**

**A : Liquid limit**

**B : Plastic limit**

**C : shrinkage limit**

**D : None of the above**

**Q : 37) According to IS 2720 (V), for clayey soils to ensure uniform distribution of moisture throughout the soil mass, after mixing water, the soil-water mixture shall be left to stand of X hours, where X is:**

**A : 16**

**B : 12**

**C : 18**

**D : 24**

**Q : 38) If the sensitivity of a soil is between 4 and 8, then it will be called as:**

**A : Insensitive soil**

**B : Less sensitive soil**

**C : Sensitive soil**

**D : Extra sensitive soil**

**Q : 39) The property of a soil which allows it to be deformed rapidly, without elastic rebound and without volume changes is called as :**

**A : Yielding**

**B : Strain softening**

**C : Strain hardening**

**D : Plasticity**



**Q : 40) If two soils S1 and S2 tested in the laboratory are having liquid limits 38% and 60% and plastic limits 18% and 20% respectively. If natural moisture content for S1 and S2 is 40% and 50% respectively, which soil is a better foundation material when remoulded.**

**A : S1**

**B : S2**

**C : S1 and S2**

**D : Neither S1 and S2**

**Q : 41) Which of the following can be considered as quick clay?**

**A : Sensitivity = 0**

**B : Sensitivity = 1**

**C : Sensitivity = 100**

**D : Sensitivity =  $\infty$**

**Q : 42) Consider the following statements:**

- (i) A recovery ratio of less than 1 implies that the soil has compressed**
- (ii) A recovery ratio greater than 1 implies that the soil has swelled**
- (iii) A recovery ratio less than 1 implies that the soil has swelled**
- (iv) A recovery ratio greater than 1 implies that the soil has compressed**

**Which of these statements is/are correct?**

**A : (i) and (ii)**

**B : Only (i)**

**C : (iii) and (iv)**

**D : Only (iv)**

**Q : 43) Flow index is-**

**A : The rate at which a soil mass loses its shear strength with an increase in water content.**

**B : The rate at which a soil mass gains its shear strength with an increase in water content**

**C : The rate at which a soil mass loses its shear strength with a decrease in water content.**

**D : The rate at which a soil mass gains its shear strength with a decrease in water content.**

**Q : 44) Accurate specific gravity determination method is:**

**A : Sand bath method**

**B : Density bottle method**

**C : Pycnometer method**

**D : Alcohol method**

**Q : 45) The plastic limit and liquid limit of a soil are 30% and 42% respectively. The percentage volume change from liquid limit to dry state is 35% of the dry volume. Similar the percentage volume change from plastic limit to dry state is 22% of the dry volume. The shrinkage ratio will be nearly**

**A : 4.2**

**B : 3.1**

**C : 2.2**

**D : 1.1**



**Q : 46) Consider the following statements:**

- 1. When a soil sample is dried beyond its shrinkage limit, the volume of the soil slowly decreases**
- 2. Plastic limit is always lower than the liquid limit for any type of soil**
- 3. At the liquid limit, the soil behaves like a liquid and possesses no shear strength at all**
- 4. When subjected to drying, the volume of the soil remains unchanged once the water content of the soil goes below its shrinkage limit.**

**Which of the above statements are correct?**

**A : 1 and 3 only**

**B : 1 and 4 only**

**C : 2 and 3 only**

**D : 2 and 4 only**

**Q : 47) The admixture of sand or silt to clay causes**

**A : Decrease in liquid limit and increase in plasticity index**

**B : Decrease in liquid limit and no change in plasticity index**

**C : Decrease in both liquid limit and plasticity index**

**D : Increase in both liquid limit and plasticity index**

**Q : 48) Which one of these methods is used to find the in-situ density of soil?**

**A : Pycnometer method**

**B : Torsion balance method**

**C : Alcohol method**

**D : Rubber balloon method**

**Q : 49) A soil sample is subjected to laboratory sieve analysis using a complete set of standard IS sieves. Out of 2 kg of soil used in the test, 800 gram was retained on IS 600 micron sieve, 1000 gram was retained on IS 500 micron sieve and the remaining 200 gram was retained on IS 425 micron sieve. The uniformity co-efficient for the soil is:**

**A : 1.412**

**B : 1.2**

**C : 0.833**

**D : 0.71**

**Q : 50) Plastic characteristics of clays are due to**

**A : Adsorbed water**

**B : Free water**

**C : Capillary water**

**D : Excessive water**

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