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**Q:) Consider the following important lines defining different land-widths in the context of roads:**

- 1. Centre line**
- 2. Building line**
- 3. Road boundary**
- 4. Control line**

**The correct sequence of these lines w.r.t. location is**

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

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

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

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

**Q:) Assertion (A): The super-elevation increases along the length of transition curve.**

**Reason (R): The radius of transition curve decreases along the length of the curve.**

**Q:) The compensated gradient provided at the curve of radius 60 m with a ruling gradient of 6% is**

**A : 0.0525**

**B : 0.0475**

**C : 0.045**

**D : 0.0375**

**Q:) Given that:**

**Speed of a vehicle =  $V$  kmph**

**Brake reaction time =  $t$  second**

**Efficiency of the brakes =  $\eta$**

(a)  $0.28 V^2 t + \frac{V}{0.01\eta}$

(b)  $28 Vt + \frac{V^2}{0.1\eta}$

(c)  $0.28 Vt + \frac{0.01V^2}{\eta}$

(d)  $0.28 V^2 t + 0.01\eta V^2$

**Q:) If N is the algebraic difference of grades, S is the headlight sight distance in metres, then the transmission length of a valley curve (following standard codes) should roughly be equal to**

**A :  $NS^2/6$**

**B :  $NS^2/9.6$**

**C :  $NS^2/4$**

**D :  $NS^2/10$**

**Q:) Match List-I (Type of pavement) with List-II (Camber) and select the correct answer using the codes given below the lists:**

<b>List-I</b>	<b>List-II</b>
A. Cement concrete	1. 4.0 %
B. Water-bound macadam	2. 3.0%
C. Thin bituminous	3. 2.5%
D. Earth	4. 2.0%

**Codes:**

**A: a - 3, b - 1, c - 4, d - 2**

**B: a - 4, b - 2, c - 3, d - 1**

**C: a - 3, b - 2, c - 4, d - 1**

**D: a - 4, b - 1, c - 3, d - 2**

**Q:) If the width of a carriage way is 5.5 m, then what is it called?**

**A : Single lane**

**B : Two lanes**

**C : Intermediate lane**

**D : Multi-lane**



**Q: ) Scale adopted for geographical map**

**A : 1 cm = 2.5 km**

**B : 1 cm = 0.25 km**

**C : 1 cm = 160 km**

**D : 1 cm = 5 m to 25 m**

**Q:) Turing the telescope about inneraxis**

**A : Reduction to centre**

**B : Closing of horizontal**

**C : Tilting the abidade**

**D : Swinging the alidade**

**Q:) A glacial clay characterized by distinctness marked annual deposit of sediment**

**A : lacustine**

**B : Peat**

**C : Till**

**D : Varved clay**

**Q:) Horizontal tunnels constructed at shallow depth along the bank of river through the water bearing strata**

**A : Infiltration galleries**

**B : Infiltration wells**

**C : Springs**

**D : Wells**

**Q:) Bacilli bacteria are**

**A : Curved shape**

**B : Round shape**

**C : Rod Shape**

**D : Helicol shape**

**Q:) Acceptable limit of turbidity in domestic potable water Quality parameters**

**A : 15-25 ppm**

**B : 0-10 ppm**

**C : 25-40 ppm**

**D : None of these**

**Q:) \_\_\_\_\_ occurs in upper portion of the secondary settling tanks**

**A : Zone and compression settling**

**B : Flocculent settling**

**C : Discrete settling**

**D : Zone settling**

**Q:) Grade line & centre line of road are establishing in which surveying**

**A : Reconnaissance**

**B : Preliminary survey**

**C : Detailed Survey**

**D : None of these**



**Q:) Width of roading or formation for two lane NH in plain terrain**

**A : 3.75 m**

**B : 7 m**

**C : 40 m**

**D : 12 m**



**Q:) If the proportion of soil passing 75 micron sieve is 50% and the liquid limit and plastic limit are 40% and 20% respectively, then the group index of the soil is**

**A : 3.8**

**B : 5.5**

**C : 3.8**

**D : 65**

**Q:) Based on grain distribution analysis, the  $D_{10}$ ,  $D_{30}$  and  $D_{60}$  values of a given soil are 0.23 mm, 0.3 mm and 0.41 mm respectively. As per IS code, the soil classification will be**

**A : SW**

**B : SP**

**C : SM**

**D : SC**

**Q:) In comparison to Waterberg limits of normal soils, the expansive soil have which of the following?**

- 1. More liquid limit**
- 2. Less plastic limit**
- 3. Less shrinkage limit**
- 4. More volumetric shrinkage**

**Select the correct answer using the code given below**

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

**B : 1, 3 and 4 only**

**C : 2 and 3 only**

**D : 1, 2 and 4 only**

**Q:) Which one of the following statements is correct?**

**A : Grain size is the primary criterion for classification of coarse, as well as fine-frained soil**

**B : Grain size is the primary criterion for classification of coarse-grained soils**

**C : Plastic curve classifies coarse grained soils**

**D : Plasticity characteristics relate to classification of coarse-grained soils**

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

- 1. A conspicuous break in the continuity of a grain size distribution curve indicates a mixture of soil from two different layers.**
- 2. A steep grain size distribution curve indicates prevalence of nearly uniform grain size.**
- 3. A flat grain size distribution curve indicates certain range of passing grain sizes.**

**Which of these statements are correct?**

- A : 1, 2 and 3**
- B : 2 and 3 only**
- C : 1 and 3 only**
- D : 1 and 2 only**

**Q:) Arrange the following soils with respect to increasing order of realizable friction ratio:**

- 1. Loose gravel fill**
- 2. Sands or gravels**
- 3. Clay sand mixtures and silts**
- 4. Clays and peats**

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

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

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

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



**Q:) Consider the following clay minerals**

**1. Keolinite**

**2. Illite**

**3. Montmorillonite**

**Which one of the following is the correct sequence of the minerals above in the increasing order of their grain size?**

**A : 36952**

**B : 37259**

**C : 37623**

**D : 36952**

**Q:) Consider the following statements**

**1. Mica is a clay mineral**

**2. Rock dust particles, even of clay size are non-plastic**

**3. A particle of kaolinite is electrically charged**

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

**A : 1, 2 and 3**

**B : Only 1 and 2**

**C : Only 2 and 3**

**D : Only 1 and 3**

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

<b>List-I</b>	<b>List-II</b>
A. Course grained soil	1. Flocculated
B. Silt deposit	2. Cohesive matrix
C. Clay deposit	3. Hineycomb
D. Composite soil	4. Single-grained

**(a): A - 2, B - 3, C - 1, D - 4**

**(b): A - 4, B - 3, C - 1, D - 2**

**(c): A - 2, B - 1, C - 3, D - 4**

**(d): A - 4, B - 1, C - 3, D - 2**

**Q:) Soil is compacted at which one of the following when a higher combative effort produces highest increase in dry density?**

**A : Optimum water content**

**B : Dry side of the optimum moisture content**

**C : Wet side of the optimum moisture content**

**D : Saturation moisture content**

**Q:) When the compaction energy increases the compaction of soils:**

**A : Both OMC and maximum dry density decreases**

**B : Both OMC and maximum dry density increases**

**C : OMC decreases but maximum dry density increases**

**D : OMC increases but maximum dry density decreases**

**Q:) Which one of the following rollers is suitable for soil-cement stabilized road construction?**

**A : Vibratory roller**

**B : Sheep foot roller**

**C : Pneumatic roller**

**D : Smooth wheel roller**

**Q:) A soil deposit has a void ratio 1.0 if the void ratio is reduced to 0.60 by compaction, the percentage volume loss is**

**A : 0.1**

**B : 0.2**

**C : 0.3**

**D : 0.4**

**Q:) Which one of the following equations correctly give the relationship between the specific gravity of soil grains (G) and the hydraulic gradient (i) to initiate 'quick' condition in a sand having void ratio of 0.5?**

**A :  $G = 0.5 i + 1$**

**B :  $G = i + 0.5$**

**C :  $G = 1.5 i + 1$**

**D :  $G = 1.5 i - 1$**



**Q:) In a two-layer soil system, the top soil and bottom soil are of same thickness but the coefficient of permeability of the top soil is twice that of the bottom soil of coefficient of permeability 'k'. When horizontal flow occurs, the equivalent coefficient of permeability of the system will be**

**A : 2k**

**B : 1.5 k**

**C : 1.25 k**

**D : 1.2 k**

**Q:) For water supply to a medium town, what is the daily variation factor?**

**A : 1.5**

**B : 2.5**

**C : 3**

**D : 2.5**

**Q:) In a uniform semi-infinite aquifer, the dependable discharge of a long circular open well is increased most easily by**

**A : Increasing the diameter**

**B : Making it into one with a square kerb**

**C : Deepening the well**

**D : Providing coarser screening filter**

**Q:) A water supply distribution system for an averagely-populated township is to be designed for**

**A : Maximum daily demand**

**B : Maximum hourly demand and fire demand**

**C : Average demand**

**D : Maximum daily demand and fire demand or maximum hourly demand, whichever is higher**

**Q:) In which one of the following industries the water requirement in kilo liters per unit of production is very high?**

**A : Paper industry**

**B : Steel industry**

**C : Sugar industry**

**D : Fertilizer industry**

**Q:) Which of the following determinations are NOT necessary for raw water from a lake for use as source of supply of water for boiler-feed?**

- 1. Turbidity**
- 2. Bacterial count**
- 3. Iron**
- 4. Hardness**

**Select the correct answer using the codes given below:**

**A : 1, 2 and 3**

**B : 1, 2 and 4**

**C : 1, 3 and 4**

**D : 2, 3 and 4**

**Q:) Which of the following cations impart (s) pseudo hardness to water?**

**A : Calcium only**

**B : Magnesium only**

**C : Calcium and magnesium**

**D : Sodium**

**Q:) The most common constituents of alkalinity in natural water are measured by titrating the water sample with 0.02 N H<sub>2</sub>SO<sub>4</sub> using**

**A : Ferrochrome black T and fermion indicators**

**B : Ferron and phenolphthalein indicators**

**C : Phenolphthalein and methyl orange indicators**

**D : Methyl orange and ferrochrome black T indicators**



**Q:) The concentration of chloride ions in a water sample is estimated by titration with**

**A : Sodium iododisulphate reagent using ferroin as an indicator**

**B : Ferrous ammonium sulphate reagent using soluble starch as an indicator**

**C : Silver nitrate reagent using potassium dichromate as an indicator**

**D : None of these**

**Q:) Which one of the following statements related to testing of water for municipal use is correctly applicable?**

**A : Pseudo-hardness is due to presence of fluoride in water**

**B : When alkalinity  $\leq$  total hardness, carbonate hardness in mg/l = Total hardness in mg/l**

**C : Bicarbonate alkalinity = total alkalinity - (carbonate alkalinity - hydroxide alkalinity)**

**D : Hydroxide alkalinity = carbonate alkalinity + Bicarbonate alkalinity**

**Q:) Which one of the following compounds of nitrogen, when in excessive amounts in water, contributes to the illness known as infant methemoglobin?**

**A : Ammonia Cal nitrogen**

**B : Albuminoidal nitrogen**

**C : Nitrite**

**D : Nitrate**

**Q:) Consumptive use refers to the loss of water as a result of**

**A : Evaporation and transpiration**

**B : Crop water requirement**

**C : Evaporation and infiltration**

**D : Evaporation and transpiration from the cropped area**

**Q:) What is the moisture depth available for evapotranspiration in root zone of 1 m depth soil, if dry weight of soil is 1.5 gm/cc, field capacity is 30% and permanent wilting point is 10%?**

**A : 450 mm**

**B : 300 mm**

**C : 200 mm**

**D : 150 mm**

**Q:) Consider the following terms relating to irrigation requirements:**

- 1. Consumptive irrigative requirement**
- 2. Net irrigation requirement**
- 3. Field irrigation requirement**
- 4. Gross irrigation requirement**

**For a given set up, which one of the following is the correct relation?**

**A :  $1 > 2 > 3 > 4$**

**B :  $1 < 2 < 3 < 4$**

**C :  $(1 = 2) < 3 < 4$**

**D :  $1 < (2 = 3) < 4$**

**Q:) A Persian wheel with an average discharge of 230 litre/minute irrigates 1 hectare wheat crop in 50 hours. The average depth of irrigation will be nearly**

**A : 4 cm**

**B : 5 cm**

**C : 6 cm**

**D : 7 cm**

**Q:) A drained coefficient**

**A : Decides the choice of the method of the drainage**

**B : Decides the kind of crop that can be grown on the land**

**C : Is the depth of water that can be removed from the drainage area in unit time**

**D : Is the flow of water from the soil into the tile laterals per unit time**





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