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Q :) A soil is composed of soil spherical grains of identical specific gravity and diameter between 0.075 mm and 0.0075 mm. If the terminal velocity of the largest particle falling through water without flocculation is 0.5 mm/s, that for the smallest particle would be

A : 0.005 mm/s

B : 0.05 mm/s

C : 5 mm/s

D : 50 mm/s

Q :) A saturated soil mass has a total density 22 kN/m³ and a water content of 10%. The bulk density and dry density of this soil are

A : 12 kN/m³ and 20 kN/m³ respectively

B : 22 kN/m³ and 20 kN/m³ respectively

C : 19.8 kN/m³ and 19.8 kN/m³ respectively

D : 23.2 kN/m³ and 19.8 kN/m³ respectively

Q :) The following data were obtained from a liquid limit test conducted on a soil sample.

Number of blows	17	22	25	28	34
Water content (%)	63.8	63.1	61.9	60.6	60.5

The liquid limit of the soil is:

A : 0.631

B : 0.628

C : 0.619

D : 0.606

Q :) The values of liquid limit and plasticity index for soils having common geological origin in a restricted locality usually define

A : A zone above A - line

B : A straight line parallel to A - line

C : A straight line perpendicular to A - line

D : Points may be anywhere in the plasticity chart

Q :) The consistency of a saturated cohesive soil is affected by

A : Water content

B : Particle size distribution

C : Density index

D : Coefficient of permeability

Q :) A fine grained soil has liquid limit of 60 and plasticity limit of 20. As per the plasticity chart, according to IS classification, the soil is represented by the letter symbols

A : CL

B : CI

C : CH

D : CL-ML

Q :) The following two statements are made with respect to different sand samples having the same relative density.

Identify if they are TRUE and FALSE.

I. Poorly graded sands will have lower friction angle than the well graded sands.

II. The particle size has no influence on the friction angle of sand.

A : II is TRUE but I is FALSE

B : Both are FALSE statements

C : Both are TRUE statements

D : I is TRUE but II is FALSE

Q :) A soil having particles of nearly the same size is known as

A : Well graded

B : Uniformly graded

C : Poorly graded

D : Gap graded

Q :) The shape of clay particle is usually

A : Angular

B : Flaky

C : Tubular

D : Rounded

Q :) Following statements are made on compacted soil, where DS stands for the soils compacted on dry side of optimum moisture content and WS stand for the soils compacted on wet side of optimum moisture content. Identify incorrect statement:

A : Soil structure is flocculated on DS and dispersed on WS

B : Construction pore water pressure is low on DS and high on WS

C : On drying, shrinkage is high on DS and low on WS

D : On access to water, swelling is high on DS and less on WS

Q :) Deposit with flocculated structure is formed when

A : Clay particles settle on sea bed

B : Clay particles settle on fresh water lake bed

C : Sand particles settle on river bed

D : Sand particles settle on sea bed

Q :) Compaction by vibratory roller is the best method of compaction in case of

A : Moist silty sand

B : Well graded dry sand

C : Clay of medium compressibility

D : Silt of high compressibility

Q :) The zero-voids curve is non-linear owing to

A : The standard proctor test data of dry density and corresponding water content plotting as a non-linear curve

B : The dry density at 100% saturation being a non-linear function of the void-ratio

C : The water content altering during compaction

D : The soil being compacted with an odd number of blows

Q :) In a compaction test, as the compaction effort is increased, the optimum moisture content

A : Decreases

B : Remains same

C : Increases

D : Increases first then after decreases

Q :) The unit weight of a soil at zero air voids depends on

A : Specific gravity

B : Water content

C : Unit weight of water

D : All the above

Q :) Water distribution system are sized to meet the

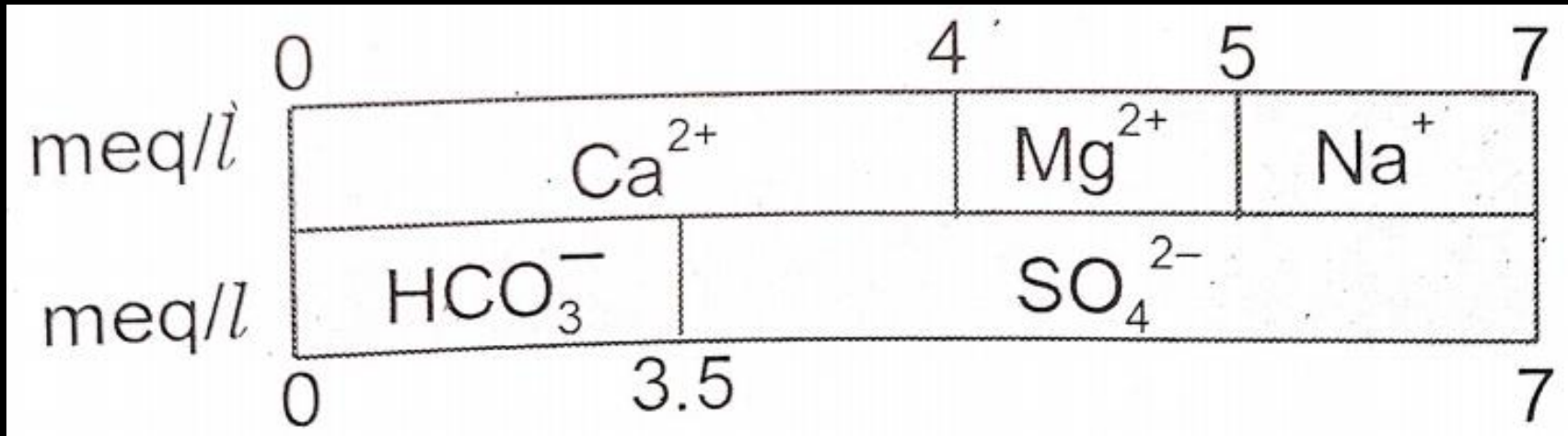
A : Maximum hourly demand

B : Average hourly demand

C : Maximum daily demand and fire demand

D : Average demand and fire demand daily

Q :) For a sample of water with the ionic composition shown below, the carbonate and Non-carbonate hardness concentration (in mg/l as CaCO₃) respectively are.



A : 200 and 50

B : 175 and 75

C : 75 and 175

D : 50 and 200

Q :) The presence of hardness in excess of permissible limit causes

A : Cardio-vascular problems

B : Skin discolouration

C : Calcium deficiency

D : Increased laundry expenses

Q :) 1 TCU is equivalent to the colour produced by

A : 1 mg/L of chloroplatinate ion

B : 1 mg/L of platinum ion

C : 1 mg/L platinum in form of chloroplatinate ion

D : 1 mg/L of organo-chloroplatinate ion

Q :) The organism, which exhibits very nearly the characteristics of an ideal pathogenic indicator is

A : Entamoeba coli

B : Escherichia coli

C : Salmonella typhi

D : Vibrio cholerae

Q :) Blue baby disease (Methaemoglobinemia) in children is caused by the presence of excess

A : Chlorides

B : Nitrates

C : Fluoride

D : Lead

Q :) Alkalinity of water can be defined correctly by one of the following ways

A : It is the measure of ability of water to neutralize oxygen

B : It is the measure of ability of water to neutralize carbonates

C : It is the presence of ions in water that will neutralize hydrogen ions

D : It is the measure of ability of water to neutralize hydroxides

Q :) Presence of fluoride in water greater than permissible level of 1.5 mg/L causes

A : Cardiovascular disease

B : Methemoglobinemia

C : Hepatitis

D : Dental flurosis

Q :) In disinfection, which of the following forms of chlorine is most effective in killing the pathogenic bacteria

A : Cl

B : OCl-

C : NH₂ Cl

D : HOCl

Q :) The following chemical is used for coagulation

A : Ammonium chloride

B : Aluminium chloride

C : Aluminium sulphate

D : Copper sulphate

Q :) Which of the following statements is FALSE?

A : Plumb line is along the direction of gravity

B : Mean sea level (MSL) is used as a reference surface for establishing the horizontal control

C : Mean sea level (MSL) is a simplification

D : Geoid is an equi-potential surface of gravity

Q :) The survey carried out to delineate natural features such as hills, rivers, forests and manmade features such as turns, towns, villages, buildings, roads, transmission lines and canals is classified as

A : Engineering survey

B : Geological survey

C : Land survey

D : Land survey

Q :) Symmetric errors are those errors

A : Whose effects are cumulative and can be determined

B : On circumference of circumscribing circle

C : Outside the great triangle

D : In the centre of the circumscribing circle.

Q :) In a closed loop traverse of 1 km total length, the closing errors in departure and latitude are 0.3 m and 0.4 m respectively. The relative precision of this traverse will be

A : 1:5000

B : 1:4000

C : 1:3000

D : 1:2000

Q :) The latitude and departure of a line AB are +78 m and -45.1 m, respectively. The whole circle bearing of the line AB is:

A : 30°

B : 150°

C : 210°

D : 330°

Q :) The local mean time at a place located in longitude $90^{\circ} 40'E$ when the standard time is 6 h 30 min and the standard meridian is $82^{\circ}30'E$ is

A : 5 h 2 min 40 s

B : 5 h 57 min 20 s

C : 6 h 30 min

D : 7 h 2 min 40 s

Q :) True meridians at different places converge

A : From south pole to north pole

B : From equator to north and south poles

C : From north pole to south pole

D : None of above



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