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Q:) Due to rise in temperature, the viscosity and unit weight of percolating fluid are reduced to 70% and 90% respectively. Other things being constant, the change in coefficient of permeability will be

- A : 0.2
- B : 0.286
- C : 0.63
- D : 0.778



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Q:) A bed of sand consists of three horizontal layers of equal thickness. The value of Darcy's k for the upper and lower layers is 1×10^{-2} cm/sec and that for the middle layer is 1×10^{-1} cm/sec, The ratio of the permeability of the bed in the horizontal direction to that in the vertical direction is

- A : 10.0 to 1
- B : 2.8 to 1
- C : 2.0 to 1
- D : 1 to 10



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Q:) The total, neutral and effective vertical stresses (in Um^2) at a depth of 5m below the surface of a fully saturated soil deposit with a saturated density of 2t/m^3 would , respectively, be

- A : 5, 5 and 10
- B : 5, 10 and 5
- C : 10, 5 and 10
- D : 10, 5 and 5



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Q:) Consider the following statement:

1. Coarse sand is more than a million times permeable than a high plasticity clay
2. The permeability depends on the nature of soil and not on properties of liquid flowing through soil
3. If a sample of sand and a sample of clay have the same void ratio, both samples will exhibit the same permeability.
4. Permeability of soil decrease as the effective stress acting on the soil increases

Which of the statement given above are correct?

- A : 1 and 2
- B : 1 and 3
- C : 1 and 4
- D : 2 and 3

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Q:) Consider the following statements:

1. Organic matter increases the permeability of a soil

2. Entrapped air decreases the permeability of a soil

Which of the statements given above is/are correct?

A : 1 only

B : 2 only

C : Both 1 and 2

D : Neither 1 nor 2



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Q:) Consider the following statements:

The coefficient of permeability K depends upon

1. Void ratio of the soil.
2. Duration of flow.
3. Equivalent diameter of the soil grains.
4. Shape of the particle.

Which of the above statements are correct?

A : 1, 2, 3 and 4

B : 2 and 3 only

C : 1, 3 and 4 only

D : 3 and 4 only

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Q:) Coefficient of permeability of an underground stratum is 0.001 m/s. Discharge obtained from a well of area 20^2 dug into this stratum (with drawdown of 2 m) will be

- A : 2400 lpm
- B : 2000 lpm
- C : 1200 lpm
- D : 1000 lpm



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Q:)

Assertion (A): At the same void ratio desiccated clay is stronger than saturated clay.

Reason (R): Desiccation impacts (induces) pre-compressive forces in the soil structure.



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Q:) Consider the following statements:

1. Presence of moisture in sand does not affect the magnitude of friction angle.
2. Moisture introduces capillary effect in a sandy soil leading to apparent increase in angle of internal friction.
3. Moisture introduces capillary effect in a sandy soil leading to development of apparent cohesion.
4. The capillary film is broken by drying or submergence leading to loss in the apparent cohesion.

Which of these statements are correct?

A : 1, 2, 3 and 4

B : 2 and 3 only

C : 2 and 4 only

D : 3 and 4 only

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Q:) The void ratio of a given soil A is twice that of the another soil B, while the effective size of particles of soil A is one-third of that of soil B. The ratio of height of capillary rise of water in soil A to that in soil B will be

A : 0.67

B : 1

C : 1.5

D : 2



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Q:) A flow net is drawn to obtain

A : Seepage, coefficient of permeability and uplift pressure

B : Coefficient of permeability, uplift pressure and exit gradient

C : Exit gradient, uplift pressure and seepage quantity

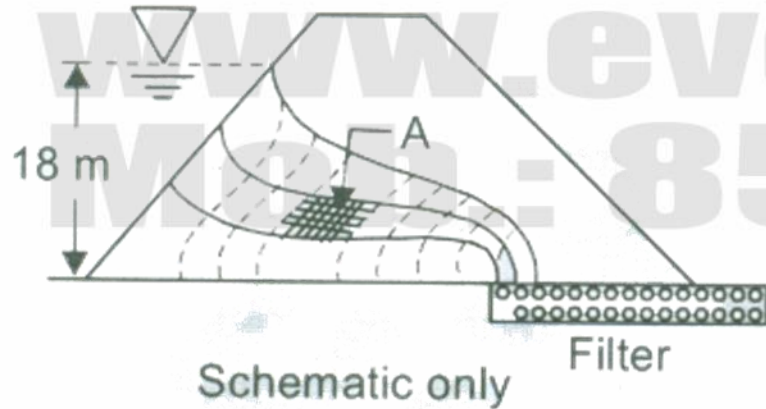
D : Exit gradient, seepage and coefficient of - permeability



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Q:) In the schematic flow net shown in the given figure, the hydraulic potential at point A is



- A : 5 m of water
- B : 12 m of water
- C : 15 m of water
- D : 25 m of water

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Q:) A flow net constructed determine the seepage through an earth dam which is homogeneous but anisotropic, gave four flow channels and sixteen equipotential drops. The coefficients of permeability in the horizontal and vertical directions are 4.0×10^{-7} m/s and 1.0×10^{-7} m/s, respectively. If the storage head was 20 m , then the seepage per unit length of the dam (in m^3/s) would be

A : 5×10^{-7}

B : 10×10^{-7}

C : 20×10^{-7}

D : 40×10^{-7}



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Q:) To make certain that the backfill material is more pervious than the soil to be drained, the relationship used is

A : $(D_{15})_{\text{filter}} < 5(D_{85})_{\text{protected soil}}$

B : $(D_{15})_{\text{filter}} > 5(D_{85})_{\text{protected soil}}$

C : $(D_{15})_{\text{filter}} < 5(D_{15})_{\text{protected soil}}$

D : $(D_{15})_{\text{filter}} > 5(D_{15})_{\text{protected soil}}$



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Q:) The configuration of flow nets depends upon

A : The permeability of the soil

B : The difference in the head between upstream and downstream sides

C : The boundary conditions of flow

D : The amount of seepage that takes place



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Q:) Consider the following statements:

Phreatic line in an earth dam is

1. Elliptic in shape
2. An equipotential line
3. The topmost flow line with zero water pressure.
4. Approximately a parabola

Of these statements

A : 1, 2 and 3 are correct

B : 2, 3 and 4 are correct

C : 3 and 4 are correct

D : 1 alone is correct

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Q:)

Assertion (A): The possibility of quicksand condition occurring is more on the downstream of a weir on permeable foundation.

Reason (R): Seepage lines are directed upwards at the downstream of such a weir.



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Q:) Consider the following statements:

1. Quick condition and liquefaction of saturated sands are based on similar phenomenon.
2. Quick condition is associated with only earth dams.
3. Liquefaction is possible in dry sand also.
4. Liquefaction is associated with increase in pore water pressure due to vibrations.

Which of these statements are correct?

A : 2 and 4

B : 1 and 4

C : 1 and 2

D : 1, 3 and 4

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Q:) Match List-I (Protective Measure) with List-II (Purpose) and select the correct answer using the codes :

List - I	List - II
A. Inverted filter	1. To protect river banks from erosion by river flow
B. Riprap	2. To prevent escape of fine soils by seepage water
C. Clay core	3. To reduce damage due to liquefaction of saturated granular soils during earthquakes
D. Sand columns	4. To reduce seepage of water through the body of the earth dams

Codes:

A : A-4, B-3, C-2, D-1

B : A-2, B-3, C-4, D-1

C : A-4, B-1, C-2, D-3

D : A-2, B-1, C-4, D-3

Q:) Consider the following statements

1. Quicksand is a special variety of sand.
2. Quicksand is not a material but a hydraulic condition.
3. In nature, quicksand condition is observed usually in coarse silt or fine sand.

Which of the above statements are correct?

A : 1, 2 and 3

B : 1 and 2 only

C : 2 and 3 only

D : 1 and 3 only



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