

**India's No.1 Study Channel**

# **Permeability and Seepage**

**15.02.2019**

1. Quick sand is a

- A) Type of sand
- B) Flow condition occurring in cohesive soil
- C) Flow condition occurring in cohesionless soil
- D) Flow condition occurring in both cohesive and cohesionless soil

2. The critical hydraulic gradient of a soil mass of specific gravity  $G$  and void ratio  $e$  is given by

- A)  $i_c = \frac{G+1}{1-e}$
- B)  $i_c = \frac{G-1}{1+e}$
- C)  $i_c = \frac{G+1}{1+e}$
- D)  $i_c = \frac{G-1}{1-e}$

3. Effective stress on soil

- A) Increases void ratio and decreases permeability
- B) Increases both void ratio and permeability
- C) Decreases both void ratio and permeability
- D) Decreases void ratio and increases permeability

4. If the permeability of a soil is 0.8 mm/sec, the type of soil is

- A) Gravel
- B) Sand
- C) Silt
- D) Clay

5. Which of the following methods is more suitable for the determination of permeability of clay soil ?

- A) Constant head method
- B) Falling head method
- C) Horizontal permeability test
- D) None of the above

6. Which of the following methods is best suited for determination of permeability of coarse grained soil?

- A) Constant head method
- b) Variable head method
- C) Both of the above
- D) None of the above

7. Due to a rise in temperature, the viscosity and the unit weight of the percolating fluid are reduced to 60% and 90% respectively. If other things remain constant, the coefficient of permeability

- A) Increases by 25%
- B) Increases by 50%
- C) Increases by 33.3%
- D) Decreases by 33.3%

8. Coefficient of permeability of soil

- A) Does not depend upon temperature
- B) Increases with increase in temperature
- C) Increases with the decrease in temperature
- D) None of the above

9. The average coefficient of permeability of natural deposits

- A) Parallel to stratification is always greater than that perpendicular to stratification
- B) Parallel to stratification is always less than that perpendicular to stratification
- C) is always same in both directions
- D) Parallel to stratification may or may not be greater than that perpendicular to stratification

10. What will be the ratio of average permeability in the horizontal direction to that in the vertical direction for soil deposit consisting of three horizontal layers, if the thickness and permeability of the second layer are twice those of the first, those of third layer are twice than those of second?

11. A sample of soil 10cm dia, 15cm length was tested in variable head method. The initial head of water in the burette was found to be 45 cm and it was observed to drop to 30 cm in 195 seconds, the dia of burette was 1.9 cm. Find the coefficient of permeability in metre per day.

12. A flownet is plotted for a homogenous Earth and dam of 30m height with a free Board of 5m. If  $K=0.0006$  cm/s, number of flow channel is 4, equipotential drops are 10. Find the discharge per metre run of dam.

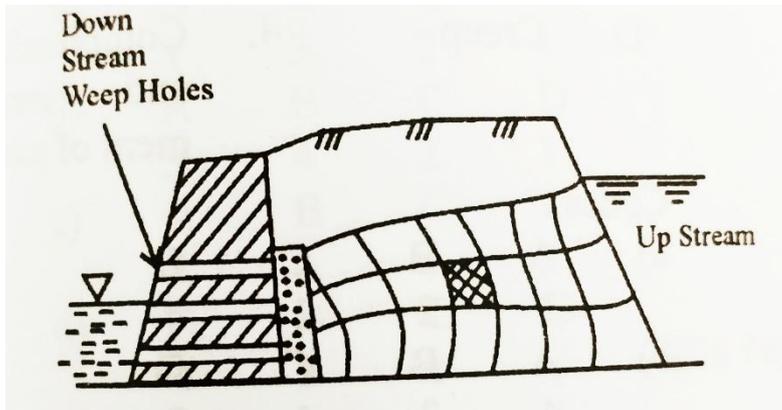
13. A deposit of fine sand has a porosity of 45%. Estimate the critical hydraulic gradient to develop quick sand condition if the specific gravity is 2.7.

14. The flownet for an Earth dam with 30m water depth consists of 25 potential drops and 5 flow channels. The coefficient of permeability of the material is 0.03 mm/sec. The discharge per metre length of the dam is

- A) 0.00018 cubic metre per sec
- B) 0.0045 cubic metre per sec
- C) 0.18 cubic metre per second

D) 0.1125 cubic metre per second

15. Consider the flow net shown in figure:

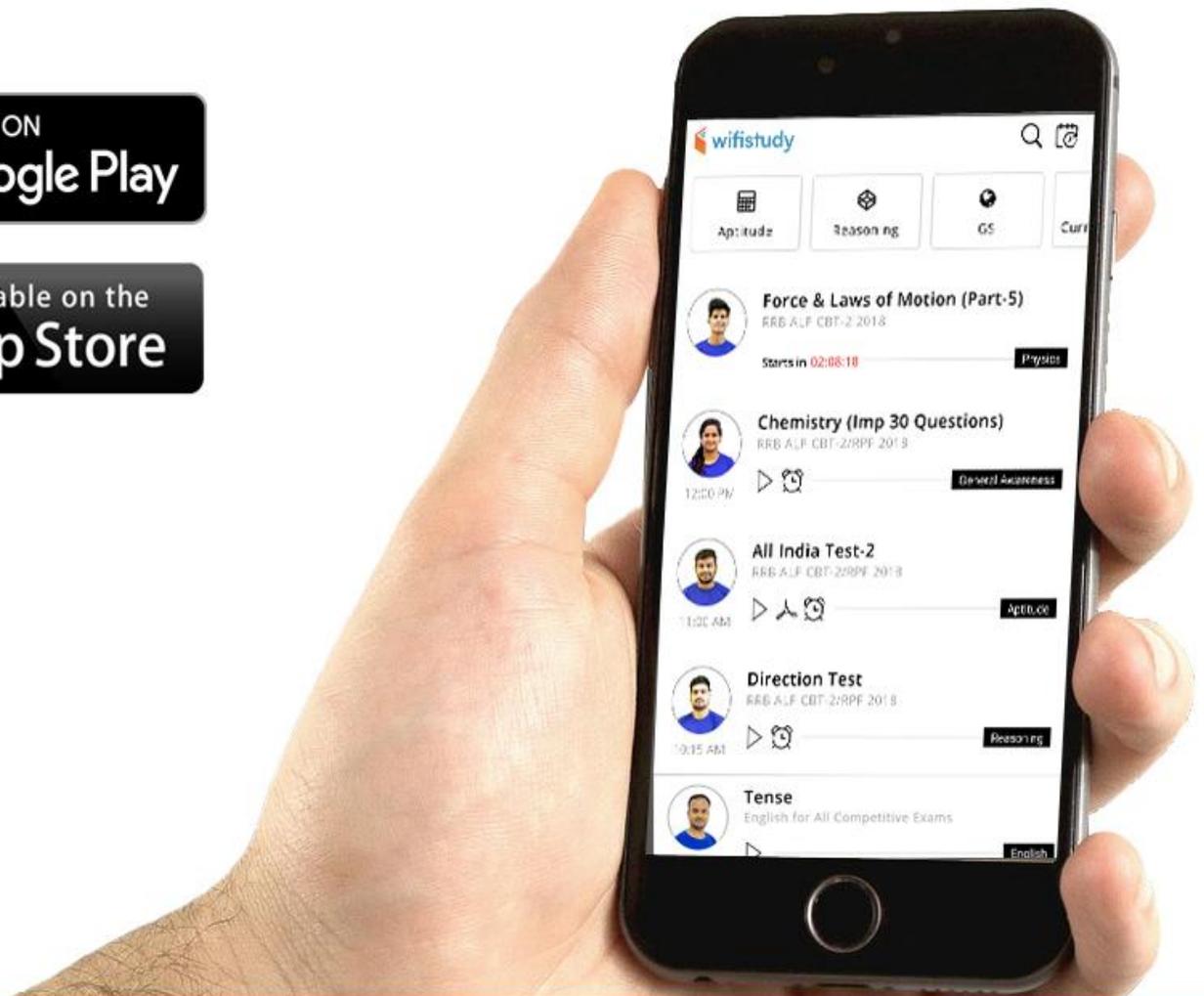


The ratio of the number of flow channels to the number of potential drops is

- A)  $3/8$
- B)  $3/7$
- C)  $4/7$
- D)  $4/8$



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