

Unit 9 - Week 7

Course outline

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● Lecture 31 : Miscible displacement (contd.)

● Lecture 32 : Miscible displacement (fractured porous media)

● Lecture 33 : Miscible displacement (viscous front)

● Lecture 34 : Immiscible flow

● Lecture 35 : Immiscible flow (contd.)

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Assignment 7

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-09-18, 23:59 IST.

1) For flow through a fracture with leak-off into the matrix, 1 point

- a) the pressure along the fracture changes linearly with distance from the inlet
- b) magnitude of pressure gradient increases with distance from inlet
- c) magnitude of pressure gradient decreases with distance from inlet
- d) the pressure along the fracture decreases linearly with distance from the inlet

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

2) For flow through a fracture without leak-off into the matrix, 1 point

- a) the pressure along the fracture decreases linearly with distance from the inlet
- b) magnitude of pressure gradient increases with distance from inlet
- c) magnitude of pressure gradient decreases with distance from inlet
- d) the pressure along the fracture remains constant

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

3) Longitudinal Dispersivity can be expressed in the following form 1 point

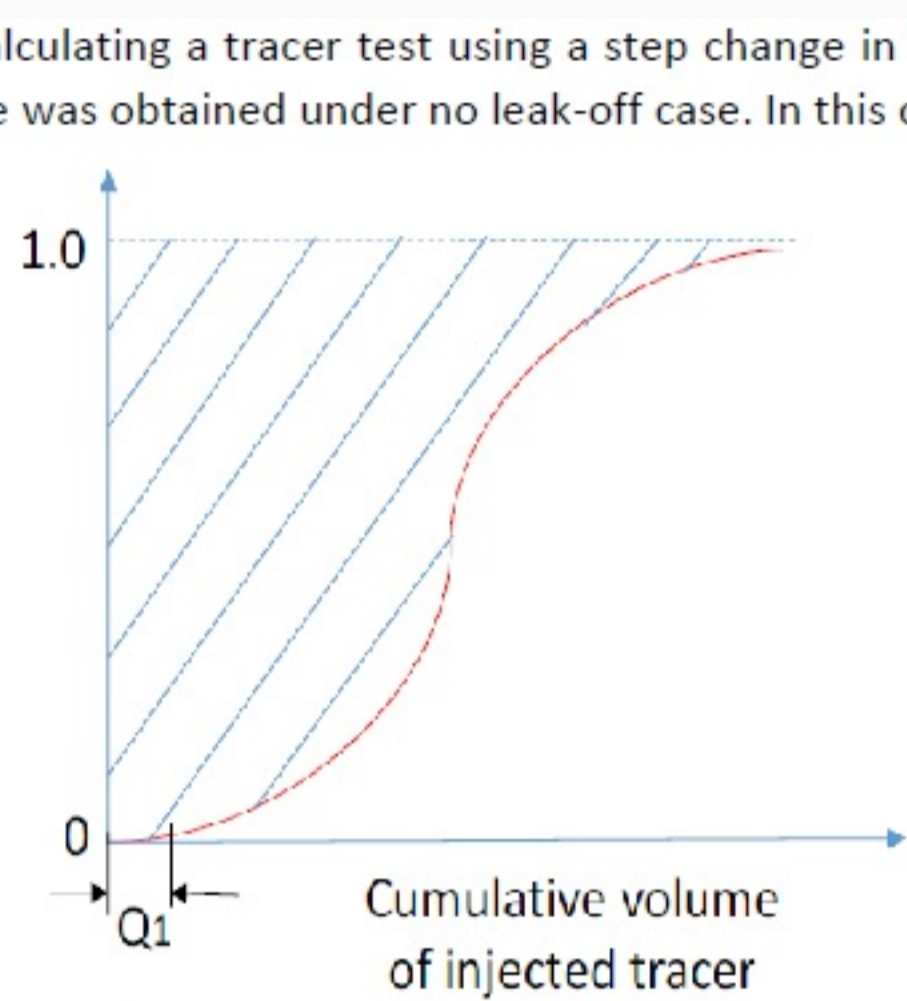
- (a) $\alpha_L = \frac{\phi D_L}{V_{superficial}}$
- (b) $\alpha_L = \frac{D_L}{V_{superficial}}$
- (c) $\alpha_L = \frac{D_L}{L}$
- (d) None of the above

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

4) While calculating a tracer test using a step change in tracer concentration, following tracer response was obtained under no leak-off case. In this case Q_1 signifies 1 point



- a) Volume of fracture
- b) Volume of dead-zone if any in the system
- c) Total volume of the core including fracture and matrix
- d) Nothing of significance to this problem

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

5) The hatched area in the figure associated with Question 4, can provide an estimate of 1 point

- a) Volume of fracture
- b) Volume of dead-zone if any in the system
- c) Total volume of the core including fracture and matrix
- d) Nothing of significance to this problem

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

6) Viscous instability arises when 1 point

- a) a fluid of lower viscosity displaces a fluid of higher viscosity
- b) a fluid of higher viscosity displaces a fluid of lower viscosity
- c) both displacing and displaced fluids are of equal viscosity
- d) displacing and displaced fluids are both shear-thinning

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

7) Consequence of viscous instability would be 1 point

- a) Very high pressure drop to establish the flow
- b) Very high vorticity in the flow
- c) Incomplete displacement of the fluid
- d) None of the above

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

8) When a fluid of higher viscosity displaces a less viscous fluid from the porous media at constant rate, the pressure drop over the length of the porous media 1 point

- a) remains constant with continued displacement
- b) increases with continued displacement
- c) decreases with continued displacement
- d) does not follow any of the patterns, mentioned above

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

9) When a fluid of higher viscosity displaces a less viscous fluid from the porous media at constant injection pressure, the velocity of the front 1 point

- a) remains constant with continued displacement
- b) increases with continued displacement
- c) decreases with continued displacement
- d) does not follow any of the patterns, mentioned above

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

10) A liquid forms a contact angle of 15° to glass, and the surface tension of the liquid is 70 mN/m . If a glass capillary of 1 mm diameter is inserted into a pool of this liquid, the height (cm) of liquid inside glass capillary above the water level of the pool would be 1 point

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 2.5,3.0

11) A liquid forms a contact angle of 15° to glass, and the surface tension of the liquid is 70 mN/m . If a glass capillary of $1 \mu\text{m}$ diameter is inserted into a pool of this liquid, the height (m) of liquid inside glass capillary above the water level of the pool would be 1 point

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 25,30

12) Laplace pressure for a spherical drop of radius r inside a continuous fluid is expressed as 1 point

- (a) $\frac{2\sigma}{r}$
- (b) $\frac{\sigma}{2r}$
- (c) $\frac{\sigma}{2\pi r}$
- (d) $\frac{\sigma}{\pi r^2}$

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

13) If multiple drops of different sizes are connected together in a two-phase medium, then which of the following is not true 1 point

- (a) Laplace pressure inside smaller droplets is larger than the Laplace pressure in larger droplet
- (b) Smaller droplets will collapse and larger droplets will expand
- (c) Flow of liquid takes place from smaller droplet to larger droplet
- (d) Size of droplets will remain unchanged

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.

14) Which of the following is not attributed to contact angle hysteresis? 1 point

- (a) Impurities
- (b) Surface roughness
- (c) Pressure
- (d) All of the above

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

15) A fluid of surface tension 70 mN/m and viscosity 10^{-3} Pa.s forms a contact angle 15° with glass, and enters into a glass capillary of diameter $1 \mu\text{m}$ by imbibition. Calculate the velocity (cm/s) of the fluid front in the capillary after the front has travelled 1 cm into the pore. 1 point

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.05,0.1