

## Unit 14 - Week 12

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## Assignment 12

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

**Due on 2019-10-23, 23:59 IST.**

1) Thermal equilibrium assumption in flow through porous medium means 1 point

- Single temperature field applicable to both solid and fluid
- Uniform temperature over the entire porous medium
- An equilibrium temperature gradient along the porous medium, determined by the thermodynamic consideration
- None of the above

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

a.

2) For a random structured porous media, the thermal conductivity of the solid phase is 1 point

- Proportional to porosity
- Proportional to (porosity)<sup>n</sup> where n is a fraction
- Same as the thermal conductivity of bulk solid
- None of the above

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

b.

3) In the heat balance equation over a differential element in porous medium, the heat accumulation in fluid phase may be expressed as 1 point

- $(1 - \phi)(\rho c_p) \frac{\partial T}{\partial t}$
- $\phi \rho c_p \frac{\partial T}{\partial t}$
- $\rho c_p \frac{\partial T}{\partial t}$
- None of the above

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

b.

4) Directional thermal conductivity of structured porous medium is based on 1 point

- direction of crystal plane of the solid phase
- theory of network of thermal resistors
- weighted average of thermal conductivity and heat transfer coefficient
- None of the above

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

b.

5) Mean field model with volume averaging does not assume 1 point

- two temperature fields, applicable to solid and fluid phases respectively
- single temperature field applicable to both solid and fluid
- heat transfer between solid and fluid
- directional thermal conductivity

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

b.

6) Heat transfer coefficient for a porous medium can be calculated using the correlation 1 point

- $Nu = 0.1(Re)^{(1-0.5Da_g)} + Da_g$
- $Nu = 0.323(Re)^{2/3}(Pr)^{1/3}$
- $Nu = constant$
- None of the above

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

a.

7) Gas expansion (He) porosimetry works on the principle of 1 point

- Pore size can be determined from the external pressure needed to force the fluid into the pore against the opposite force of surface tension
- Volume of solid in the porous medium can be measured by conducting the fluid displacement and using Pressure-volume relationship
- Langmuir theory, extended to multilayer molecular adsorption
- None of the above

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

b.

8) Mercury porosimetry works on the principle of 1 point

- Pore size can be determined from the external pressure needed to force the fluid into the pore against the opposite force of surface tension
- Volume of solid in the porous medium can be measured by conducting the fluid displacement and using Pressure-volume relationship
- Langmuir theory, extended to multilayer molecular adsorption
- None of the above

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

a.

9) Formation resistivity factor is important in the context of 1 point

- Porosity and water saturation of the rock
- Porosity only
- Electroosmotic flow through porous medium
- None of the above

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

a.

10) Nitrogen adsorption-desorption experiment works on the principle of 1 point

- Pore size can be determined from the external pressure needed to force the fluid into the pore against the opposite force of surface tension
- Volume of solid in the porous medium can be measured by conducting the fluid displacement and using pressure-volume relationship
- Langmuir theory, extended to multilayer molecular adsorption
- None of the above

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

c.

11) What type of pump is used in liquid permeameter 1 point

- Syringe Pump
- Centrifugal Pump
- Vacuum Pump
- None of the above

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

a.

12) In the lab model, shown for packed bed, the flow rate was measured by 1 point

- Rotameter
- Turbine meter
- Bucket and a stopwatch
- None of the above

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

c.

13) In the lab model, shown for packed bed, the pressure drop was measured by 1 point

- Manometer
- Pressure gauge
- Differential pressure transducer
- None of the above

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

a.

14) In the lab model, shown for fluidized bed, with increase in water flow rate 1 point

- the bed height remained unchanged
- the bed height increased continuously
- the bed height increased in steps
- None of the above

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

b.

15) In the lab model, shown for fluidized bed, the water flow rate was measured by 1 point

- Rotameter
- Turbine meter
- Bucket and a stopwatch
- None of the above

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

a.