Unit 14 - Week 12

Assignment 12

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

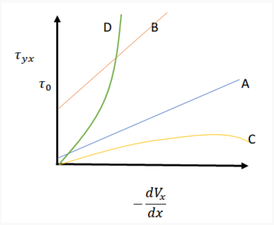
Due on 2020-12-09, 23:59 IST.

1) Thiele modulus is defined as: *1 point*

- $\frac{Reaction\ rate}{Diffusion\ rate} * (mass\ flux)$
- $\frac{Diffusion\ rate}{Reaction\ rate}$
- $\frac{Reaction\ rate}{Diffusion\ rate} * (Effective\ diffusivity)$
- $\frac{Reaction\ rate}{Diffusion\ rate}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\frac{Reaction\ rate}{Diffusion\ rate}$

2) Identify the types of fluid from the graph below *1 point*



- A- Newtonian, B- Bingham plastic, C- Pseudoplastic, D- Dilatant
- A- Bingham plastic, B- Newtonian , C- Dilatant, D- Pseudoplastic
- A- Newtonian, B- Bingham plastic, C- Dilatant, D- Pseudoplastic
- A- Bingham plastic, B- Newtonian , C- Pseudoplastic, D-Dilatant

No, the answer is incorrect.
Score: 0
Accepted Answers:
A- Newtonian, B- Bingham plastic, C- Pseudoplastic, D- Dilatant

3) Define Reynold's number (N_{Re}): *1 point*

- $N_{Re} = \frac{\mu}{\rho v d}$
- $N_{Re} = \frac{\mu v d}{\rho}$
- $N_{Re} = \frac{\rho v d}{\mu}$
- $N_{Re} = \frac{\rho v}{d \mu}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$N_{Re} = \frac{\rho v d}{\mu}$

4) Which of the following statement/s with respect to pressure is true in a well-developed laminar flow in a pipe without external forces acting? *1 point*

- Pressure varies along the circular cross section of the pipe
- Pressure does not vary along the circular cross section of the pipe
- Pressure does not vary along the axial length of the pipe
- Pressure varies with the angular position in the pipe

No, the answer is incorrect.
Score: 0
Accepted Answers:
Pressure does not vary along the circular cross section of the pipe

5) In any pulsatile flow, *1 point*

- ΔP varies with time
- ΔP does not vary with time
- $\Delta P = 0\ \forall t$
- ΔP is always sinusoidal

No, the answer is incorrect.
Score: 0
Accepted Answers:
ΔP *varies with time*

6) Hydraulic radius for a pipe is defined as *1 point*

- $\frac{Cross\ sectional\ area}{wetted\ perimeter}$
- $\frac{wetted\ perimeter}{Cross\ sectional\ area}$
- $Cross\ sectional\ area - wetted\ perimeter$
- $\frac{Diameter}{4}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\frac{Cross\ sectional\ area}{wetted\ perimeter}$

7) According to Darcy's law, *1 point*

- $Q \propto \mu L$
- $Q \propto -\Delta p$
- $Q \propto \frac{1}{\Delta p}$
- $Q \propto \frac{1}{\mu L}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$Q \propto -\Delta p$
$Q \propto \frac{1}{\mu L}$

8) For laminar flow, Nusselt number is given by the correlation, *1 point*

- $\frac{h_m D}{k} = 1.86 (N_{Re,b})^{\frac{1}{3}} \left(\frac{\mu_b}{\mu_w}\right)^{0.14}$
- $\frac{h_m D}{k} = 0.026 (N_{Re,b})^{0.8} (N_{Pr,b} \frac{D}{L})^{\frac{1}{3}} \left(\frac{\mu_b}{\mu_w}\right)^{0.14}$
- $\frac{h_m D}{k} = (N_{Re,b})^{0.8} (N_{Pr,b})^{\frac{1}{3}} \left(\frac{\mu_b}{\mu_w}\right)^{0.14}$
- $\frac{h_m D}{k} = 1.86 (N_{Re,b} N_{Pr,b} \frac{D}{L})^{\frac{1}{3}} \left(\frac{\mu_b}{\mu_w}\right)^{0.14}$

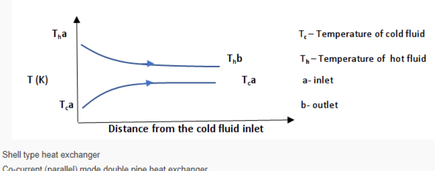
No, the answer is incorrect.
Score: 0
Accepted Answers:
$\frac{h_m D}{k} = 1.86 (N_{Re,b} N_{Pr,b} \frac{D}{L})^{\frac{1}{3}} \left(\frac{\mu_b}{\mu_w}\right)^{0.14}$

9) For turbulent flow, the ratio of the entrance length to the diameter of the pipe is: *1 point*

- less than 5
- greater than 10
- equal to zero
- less than 0.1

No, the answer is incorrect.
Score: 0
Accepted Answers:
greater than 10

10) From the temperature profile shown below, Identify the type of heat exchanger *1 point*



- Shell type heat exchanger
- Co-current (parallel) mode double pipe heat exchanger
- Counter-current (anti-parallel) mode double pipe heat exchanger
- Plate type heat exchanger

No, the answer is incorrect.
Score: 0
Accepted Answers:
Co-current (parallel) mode double pipe heat exchanger