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Unit 7 - Module 5

Assignment 5

The due date for submitting this assignment has passed. **Due on 2018-03-15, 12:29 IST.**

Submitted assignment

1) Which of the following assumptions are used to derive the expression for velocity profile in ideal gas-liquid annular flow? ***1 point***

- Flow in steady
- Flow is laminar
- Fully developed flow
- All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of the above

2) Nusselt number is the ratio of ***1 point***

- Conduction / Convection
- Radiation / Convection
- Convection/ Conduction
- All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Convection/ Conduction

3)In axisymmetric flow, the _____ velocity component is zero. ***1 point***

- Radial
- Tangential
- Angular
- None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
Angular

4) The boundary conditions at the gas-liquid interface in ideal annular flow are: ***1 point***

- Velocity components tangential to the interface in the two phases are equal
- Velocity components normal to the interface in the two phase are equal
- Continuity of shear stress at the interface

All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of the above

5) Heat transfer coefficient in a stagnant liquid film of thickness d is _____. The thermal conductivity of the liquid is k and heat capacity is C_p. ***1 point***

- kC_p
- d/k
- k/d
- k/C_p

No, the answer is incorrect.
Score: 0

Accepted Answers:
k/d

6) Which of these is are the phase change processes? ***1 point***

- Boiling
- Evaporation
- Condensation
- All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of the above

7) The specific heat capacity is an intensive property. ***1 point***

- True
- False

No, the answer is incorrect.
Score: 0

Accepted Answers:
True

8) Prandtl number is the ratio of ***1 point***

- Momentum diffusivity and mass diffusivity
- Momentum diffusivity and thermal diffusivity
- Mass diffusivity and thermal diffusivity
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Momentum diffusivity and thermal diffusivity

9) Prandtl number of air is (choose the nearest value) ***1 point***

- 0.01
- 10
- 5
- 1

No, the answer is incorrect.
Score: 0

Accepted Answers:
1

10) Heat transfer coefficient in single phase, laminar, fully-developed flow in a channel _____with increase in flow rate. **1 point**

- Increases
- Decreases
- Remains unchanged
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Increases

11) Heat transfer in slug flow regime in gas-liquid flow in microchannels is expected to be better than that in single phase flow in microchannels for low and moderate void fractions because of **1 point**

- Internal recirculations in the liquid slugs
- Internal recirculation in the gas bubbles
- Developing flow in the liquid slugs
- Internal recirculations in the liquid slugs and developing flow in the liquid slugs

No, the answer is incorrect.
Score: 0

Accepted Answers:
Internal recirculations in the liquid slugs and developing flow in the liquid slugs

12) Heat transfer in developing single phase does not depend on the following **1 point**

- Reynolds number
- Prandtl number
- Flow length
- Depends on all the above factors

No, the answer is incorrect.
Score: 0

Accepted Answers:
Depends on all the above factors

13) Consider gas-liquid flow in a channel. The specific heat capacities of water and air to be 4180 and 1000 J/kg-K, respectively. The densities of water and air are 1000 and 1.3 kg/m^3, respectively. If the superficial velocities and the volume fractions of the two phases are equal, what percent of heat entering from the wall goes into the gas phase? **1 point**

- 10%
- 50%
- 100%
- less than 0.1%

No, the answer is incorrect.
Score: 0

Accepted Answers:
less than 0.1%

14) Consider gas-liquid flow in a channel. The specific heat capacities of water and air to be 4180 and 1000 J/kg-K, respectively. The densities of water and air are 1000 and 1.3 kg/m^3, respectively. If the volumetric flow rate of the gas phase is 100 times than that of the liquid phase, what percent of heat entering from the wall goes into the gas phase? **1 point**

- 100%
- 0.3%
- 50%
- 3%

No, the answer is incorrect.
Score: 0

Accepted Answers:
3%

15) Consider gas-liquid flow in a channel. The specific heat capacities of water and air to be 4180 and 1000 J/kg-K, respectively. The densities of water and air are 1000 and 1.3 kg/m^3, respectively. If the volumetric flow rate of the gas phase is 1000 times than that of the liquid phase, what percent of heat entering from the wall goes into the gas phase? ***1 point***

- 100%
- 0.3%
- 24%
- 10%

No, the answer is incorrect.
Score: 0

Accepted Answers:
24%

16) Route of heat transfer in Taylor flow regime are ***1 point***

- Wall to bubble film
- Bubble film to liquid slug
- Wall to recirculating slug
- All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of the above

17) Calculate the inverse Graetz number Ls* for flow Reynolds number of 300, Prandtl number of 7, and nondimensional slug length of 5. ***1 point***

- 0.24
- 420
- 42
- 0.0024

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.0024

18) What would be the Nusselt number in a slug for the parameters given in Q. 17 for constant wall heat flux boundary condition? ***1 point***

- 15
- 19
- 4.363
- 10

No, the answer is incorrect.
Score: 0

Accepted Answers:
19

19) For a non-dimensional film thickness of 20 microns, what is the film Nusselt number? Use length scale as the film thickness. *1 point*

- 100
- 1
- 10
- None

No, the answer is incorrect.
Score: 0

Accepted Answers:
1

20) Refer to Q. 19, what is the Nusselt number if the length scale used is the channel diameter (1 mm)? *1 point*

- 100
- 1
- 50
- 10

No, the answer is incorrect.
Score: 0

Accepted Answers:
50

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