Week 2 : Assignment 2

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment.

Due on 2021-08-18, 23:59 IST.

1) In general classification of a process with respect to time, Continuous process is a _____ process and Batch process is a _____ process? *2 points*

(a) Steady state, Steady state
(b) Steady state, Unsteady-state
(c) Unsteady-state, Steady state
(d) Unsteady-state, Unsteady-state

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

2) Choose the correct answer. General material balance equation can be expressed as: *2 points*

(a) Input + generation = output + accumulation – consumption
(b) Input + generation = output – accumulation + consumption
(c) Input + generation = output + accumulation + consumption
(d) Input – generation = output + accumulation + consumption

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

3) When the balanced parameter is 'Total mass' in a general balance equation, which of the following assumptions are true? *2 points*

(a) generation ≠ 0 and consumption ≠ 0
(b) generation = 0 and consumption ≠ 0
(c) generation ≠ 0 and consumption = 0
(d) generation = 0 and consumption = 0

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

4) There are two benzene (B) - toluene (T) mixtures in two separate flasks. The first mixture contains 60 wt% benzene, and the second contains 50 wt% toluene. If 250 g of the first mixture is combined with 250 g of the second mixture, what is the composition of the product? *2 points*

(a) 0.550 g B/g of product, 45.0 wt% T in the product
(b) 0.250 g B/g of product, 75.0 wt% T in the product
(c) 0.500 g B/g of product, 50.0 wt% T in the product
(d) 0.600 g B/g of product, 40.0 wt% T in the product

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

5) Liquid water is fed at a rate of 15.0 cm^3/min into a reactor. What is the molar flow rate of water in **mol/h**? *2 points*

(a) 30.0 mol/h
(b) 40.0 mol/h
(c) 50.0 mol/h
(d) 60.0 mol/h

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

6) Choose the correct answer. For a nonreactive system: *2 points*

(a) maximum number of independent equations > the number of chemical species in the input and output streams
(b) maximum number of independent equations = the number of chemical species in the input and output streams
(c) maximum number of independent equations < the number of chemical species in the input and output streams
(d) None of the these

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

7) When does a problem describing an industrial reaction is defined as overspecified and underspecified, respectively? (DOF = Degree-of-Freedom) *2 points*

(a) DOF = 0 and DOF < 0
(b) DOF < 0 and DOF > 0
(c) DOF > 0 and DOF = 0
(d) DOF > 0 and DOF < 0

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

8) A continuous separator is used to separate hexane from its mixture with water using ethyl alcohol. **Feed A** consists of 75 wt% hexane and rest water. **Feed B** consists of pure ethyl alcohol. The process is allowed for 1 hour, and one output stream consists of 15.9 wt% Hexane, 26.7 wt% water and rest ethyl alcohol. The other output stream consists of pure hexane with a flow rate of 250 kg/hr. Estimate the number of unknown variables and independent material balance equations that can be formed for this problem? *2 points*

(a) Unknown variables = 2 & Independent equations = 3
(b) Unknown variables = 3 & Independent equations = 2
(c) Unknown variables = 4 & Independent equations = 3
(d) Unknown variables = 3 & Independent equations = 3

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

9) A continuous separator is used to separate hexane from its mixture with water using ethyl alcohol. **Feed A** consists of 75 wt% hexane and rest water. **Feed B** consists of pure ethyl alcohol. The process is allowed for 1 hour, and one output stream consists of 15.9 wt% Hexane, 26.7 wt% water and rest ethyl alcohol. The other output stream consists of pure hexane with a flow rate of 250 kg/hr. Calculate the flow rate of Feed A in kg/h? *2 points*

(a) 415.9 kg/h
(b) 215.8 kg/h
(c) 389.4 kg/h
(d) cannot be determined

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

10) The dilute acid containing 25% HCl is concentrated using commercial grade HCl containing 98% HCl to obtain desired acid of 65% HCl. Calculate the amount of commercial grade HCl required to prepare 1000 kg of desired acid concentration? *2 points*

(a) 276 kg
(b) 225 kg
(c) 449 kg
(d) 551 kg

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.