Unit 10 - Week 8

Assignment 8

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

Due on 2020-11-11, 23:59 IST.

1) Select the correct option. 1 point

I. During separation of multi-component mixture by distillation, reactive and heat-sensitive components must be removed as early as possible.

II. The Fenske-Underwood-Gilliland method is quite accurate for ideal mixtures of a narrow-boiling range.

III. The Fenske-Underwood-Gilliland method can be quite inaccurate for wide-boiling feeds.

(a) Only statement – I and statement –II are true
(b) Only statement - II and statement – III are true
(c) Only statement - I and statement - III are true
(d) All the statements are true

a)
b)
c)
d)

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

2) Select the correct option about Separation Factor (SF). 1 point

I. The SF for crystallization process is very large.
II. The SF for supercritical extraction is difficult to estimate from Equations of State and is best determined by experiment.

(a) Only statement – I is true
(b) Only statement-II is true
(c) Both the statements are true
(d) Both the statements are false

a)
b)
c)
d)

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

3) Select the correct option about membranes: 1 point

I. Membranes may be porous or nonporous.
II. For porous membranes, the permeability is independent of the diffusivity through the pore.

III. For nonporous membranes, the permeability is the product of the solubility of the molecule in the membrane and its diffusivity for travel through the membrane.

(a) Only statement – I and statement –II are true
(b) Only statement - II and statement – III are true
(c) Only statement - I and statement - III are true
(d) All the statements are true

a)
b)
c)
d)

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

4) If there are four components present in a nearly liquid mixture, how many sequences of ordinary distillation columns are possible for complete separation? 1 point

(a) 3
(b) 4
(c) 5
(d) 6

a)
b)
c)
d)

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

5) A multi-component saturated liquid feed available at 1000 kmol/h and containing C_3 to C_6 hydrocarbons is to be separated by a distillation column operating at 14 bar into an overhead product that recovers 95% of the *n*-butane (Light Key) overhead and 90% of the *n*-pentane (Heavy Key) in the bottoms. Relative volatility between these two components $\alpha_{LK,HK}$ is 2.25. The minimum number of theoretical stages required will be _____ (answer rounded off to the nearest integer).
Use Fenske's relation.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 6.10

6) It is required to separate a binary mixture of propane and propylene using a sieve tray distillation column. Mass flow rates of propane and propylene entering as a feed to the distillation column are 10kg/s & 14kg/s respectively. The value of relative volatility of propylene with respect to propane is equal to 1.136 and this value does not change appreciably throughout the column. The mass flow rate of distillate is 13 kg/sec and desired concentration of propylene in overhead product is 98 mol%. Take molecular weight for propane and propylene as 44 g/mol & 42 g/mol respectively. The minimum number of plates required to carry out this separation is equal to ……(answer rounded off to the nearest integer).
Use Fenske's relation.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 45,47

1 point

7) Match the "Property" in Column A with their "Required Separation Process" in Column B. 1 point

Column A	Column B
A. Distribution Coefficient	1) Solvent extraction
B. Solubility	2) Leaching
C. Vapour Pressure	3) Drying
D. Particle Size	4) Screening

(a) A-1, B-3, C-2, D-4
(b) A-2, B-3, C-4, D-1
(c) A-4, B-3, C-2, D-1
(d) A-1, B-2, C-3, D-4

a)
b)
c)
d)

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

8) Select the correct option about distillation column. 1 point

I. To determine the number of equilibrium stages, first minimum number of stages and minimum reflux must be evaluated.

II. When the reflux ratio increases from its minimum value, the capital cost decreases and utility costs increases.

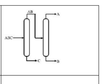
(a) Both statements are correct.
(b) Statement 1 is correct.
(c) Statement 2 is correct.
(d) Both statements are incorrect.

a)
b)
c)
d)

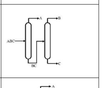
No, the answer is incorrect.
Score: 0
Accepted Answers:
a)

9) The three components (A, B, and C) can be separated by distillation column in three different ways represented by Scheme1, Scheme2, and Scheme3. Suggest which of the following scheme represent direct sequence of distillation columns? 1 point

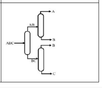
Scheme 1



Scheme 2



Scheme 3



(a) Scheme 1
(b) Scheme 2
(c) Scheme 3
(d) None of the above

a)
b)
c)
d)

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

10) Following table contains the list of products which needs to be separated by using two distillation columns in series, and their respective boiling points: 1 point

Feed	Carbon tetrachloride (A)	Ethyl acetate (B)	Ethyl bromide (C)	Propyl alcohol (D)
Normal Boiling Point(°C)	76.7	77.1	38	97

Which one of the following represents the correct order of overhead and bottom products received from the series of distillation columns?

a)

b)

c)

d)

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