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SARDAR PATEL UNIVERSITY
EXTERNAL EXAMINATION
B.SC. INDUSTRIAL CHEMISTRY (V)
(FIFTH SEMESTER)
US05CICV06: Separation Techniques
FRIDAY, 22nd November, 2019

Time: 10:00 am to 1:00 pm

Total Marks: 70

Q-1 Answer the following multiple choice question.

[10]

- Separation by distillation is not possible when relative volatility is _____.
 - < 1
 - > 1
 - ≥ 1
 - $= 1$
- The boiling point of liquid increases with _____ in pressure.
 - Constant
 - Increases
 - Decreases
 - None of above
- Raoult's law applied to the _____.
 - Nonvolatile solution
 - Ideal solution
 - Solvents
 - None of above
- HETP is the height of a section of packing that will give the same separation as that achieved with _____ theoretical plate.
 - 10
 - 1
 - 8
 - 1/8
- Adsorption of the NO_2 in water to produce nitric acid is example of absorption with _____.
 - Physical reaction
 - Chemical reaction
 - Heat transfer
 - Mass transfer
- Crystallization is carried out at relatively _____ temperature.
 - Random
 - Constant
 - Low
 - High
- Which of the following is the method of Supersaturation?
 - By adiabatic evaporation and cooling
 - By cooling concentrated hot solution
 - By evaporating a part of the solvent
 - All of these
- In agitated crystallizer supersaturation is achieved by _____.
 - Adiabatic evaporation
 - Evaporation
 - Cooling
 - None of these
- The function of knife, spreader in drum dryer is to _____.
 - Develop thin film of solid
 - Remove impurity
 - Scrap of solid from surface
 - None of these
- In falling rate period, rate of drying _____.
 - Random
 - Constant
 - Decreases
 - Increases

Q-2 Answer any ten of following.

[20]

- What is steam distillation?
- Define relative volatility.
- What is the role of bubble cap tray in distillation column?
- Write the difference between extract and raffinate.

(1)

(P.T.O)

5. What do you mean by HETP? State the factors on which HETP depends.
6. Write down the difference between leaching and liquid extraction.
7. What is Miers' Supersaturation theory?
8. Explain briefly mechanism of door thickener.
9. Enlist the various effects of impurities on crystal formation.
10. Enlist the classification of dryer.
11. What is non-adiabatic dryer?
12. What is atomizer in spray dryer?

Q-3 What are the types of distillation? Derive the operating line equation. [10]

OR

- Q-3 a. Write note on various plate used for phase contacting in distillation. [05]
b. Write a note on flash distillation. [05]

Q-4 With the neat sketch discuss the construction and working of packed column used for gas absorption. [10]

OR

Q-4 Explain in brief the mixer-settler assembly operated in counter current fashion with sketch. Give advantages of mixer-settler. [10]

Q-5 Write the note on following: [10]
1. Swenson-walker crystallizer
2. Agitated crystallizer

OR

Q-5 With flowsheet discuss the oil seed extraction in detail. [10]

Q-6 Write the note on following: [10]
1. Drum dryer
2. Tray dryer

OR

- Q-6 a. Discuss the construction & working of fluidized bed dryer with neat diagram. [05]
b. Write a short note on Air-Water system. [05]

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(2)