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SARDAR PATEL UNIVERSITY
EXTERNAL EXAMINATION
B.SC. INDUSTRIAL CHEMISTRY (V)
(FIFTH SEMESTER)
US05CICV06: Separation Techniques
SATURDAY, 3RD November, 2018

Time: 10:00 am to 1:00 pm

Total Marks: 70

Q-1 Answer the following multiple choice question.

[10]

- Rayleigh's equation is valid for _____ distillation.
 - Differential
 - Continuous
 - Flash
 - Steam
- A portion of the distillation column above feed plate portion is termed as _____.
 - Rectifying section
 - Stripping section
 - Both (a) & (b).
 - None of above
- Refluxing is the feature of _____.
 - Differential distillation
 - Flash distillation
 - Rectification distillation
 - Steam distillation
- Pall ring are available in range _____.
 - 5 - 50 mm
 - 16 - 50 mm
 - 16 - 160 mm
 - 50 - 500 mm
- The reverse of absorption is?
 - Desorption
 - Scrubbing
 - Adsorption
 - None of above
- Which of following column is a continuous gas-liquid contactor?
 - Packed
 - Bubble cap
 - Plate
 - Rectifying
- Supersaturation is the driving force for _____ unit operation.
 - Drying
 - Evaporation
 - Crystallization
 - None of these
- In crystallization mass transfer occurs from solution to _____ phase.
 - Solid
 - Liquid
 - Slurry
 - Gas
- Weight % moisture content on wet basis is calculated by _____.
 - $100 \cdot [X/(1+X)]$
 - $100/(1+X)$
 - $X/(1+X)$
 - $100X$
- Function of flight design in the inside wall of rotary dryer is _____.
 - To lift the solids
 - To move in forward direction
 - To break the lumps of solids
 - None of above

Q-2 Answer any ten of following.

[20]

- What is downcomer or weir?
- Give the statement for Dalton's law.
- What is boiling point diagram?
- Write the characteristics of tower packing.
- Compare plate column with packed column.
- State advantages and disadvantages of packed columns.
- Enlist the various methods of supersaturation.

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8. Enlist the various effects of impurities on crystal formation.
9. Give Classification of crystallizers.
10. Explain the function of scraper in drum dryer.
11. Define drying. What is adiabatic dryer?
12. Enlist the points which differentiate evaporation and drying.

- Q-3** a. Derive the material balance used for the fractionating column [05]
 b. Write a brief note on steam distillation. [05]

OR

- Q-3** a. Give the material balance of binary mixtures by simple distillation. [05]
 b. Discuss reflux ratio in detail. [05]

- Q-4** With the neat sketch discuss the mechanically agitated vessels used for gas absorption. Enlist the various factors for selecting solvent for gas absorption. [10]

OR

- Q-4** With the neat sketch explain spray column used for liquid-liquid extraction. [10]

- Q-5** a. Discuss the vacuum crystallizer with neat sketch diagram. [05]
 b. Explain the working of Basket extractor with suitable diagram. [05]

OR

- Q-5** a. Discuss the construction and working of oslo cooler crystallizer with suitable diagram. [05]
 b. Explain the factors influencing the rate of extraction in leaching. [05]

- Q-6** a. Write a brief note on tunnel dryer. [05]
 b. Explain the construction & working of spray dryer with neat diagram. [05]

OR

- Q-6** a. Explain the construction & working of rotary dryer with neat diagram. [05]
 b. Explain the construction & working of tray dryer with neat diagram. [05]

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[05]

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