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No. of Printed Pages: 2

SARDAR PATEL UNIVERSITY

B.Sc. Industrial Chemistry (Vocational)

(Semester – 5TH) EXAMINATION

25th NOVEMBER 2013, Monday

Course No. : US05CICV06

(Separation Techniques)

Total Marks: 70 **Time: 10:30 to 1:30pm**

Q.1 Answer the given multiple choice questions. **[10]**

1. Separation by distillation is not possible when relative volatility is_____ one.
   a)Greater than b) Less then c) Equal d) Both a) and b)
2. Reflux ratio is equal to ____
   a) Distillate to reflux (D/L) c) Reflux to distillate (L/D)
   b) Reflux multiply by distillate (L.D) d) None of these
3. Azeotropic mixture is___
   a) Binary mixture c) Tertiary mixture
   b) Constant boiling mixture d) None of these
4. Gas absorption is also term as
   a)Scrubbing b) Drying c) Adsorption d) None of these
5. HETP is the height of a section of packing that will give the same separation as that achieved with _____ theoretical plate.
   a)1 (b) 10 (c) 2 (d) 5
6. In gas absorption packing size should not be more than $1/8^{th}$ of column _____.
   a)Length b) Height c) Diameter d) None of these
7. In Krystal crystallizer, supersaturation is achieved by _____.
   a) Evapoartion b) Cooling c) Adiabatic evaporation d) None of these
8. Which of the following method is used for obtaining Super saturation?
   a)By cooling concentrated hot solution
   b)By evaporating a part of the solvent
   c)By adiabatic evaporation and cooling
   d)All of these
9. For drying paper sheet _____ dryer is used.
   a)Drum b) Tray c) Tunnel d) Rotary
10. Atomizer is the integral part of _____ dryer.
    a)Rotary b) Spray c) Drum d) Tunnel

Q.2 Attempt any Ten. **[20]**

i. State Raoult's law & Dalton's law.
ii. Define: Optimum reflux ratio and Relative volatility
iii. Write limitations of McCabethile method.
iv. What is channeling in packed columns? How it can be avoided/minimized?

v. Write comparision between plate column and packed column.
vi. Discuss about different characteristics of tower packings.
vii. Enlist various effects of impurities on crystal formation.
viii. Give Classification of crystallizers.
ix Draw diagram of Basket-type oil seed extractor.
x Distinguish between adiabatic dryer and non-adiabatic dryer
xi Explain equilibrium moisture and critical moisture
xii Write the function of scraper in drum dryer.

Q.3a) Derive the q-line equation. **[5]**
b) Write a note on: Fractionating column. **[5]**

OR

Q.3a) Derive Rayleigh's equation for simple distillation **[5]**
b) Write a note on : Boiling point Diagram **[5]**
Q.4a) Explain construction and working of batch operated mixer-settler with neat sketch. **[5]**
b) Write briefly on mechanically agitated vessels used for gas absorption. **[5]**

OR

Q.4a) Draw the neat sketch of packed column used for gas absorption and write about its construction and functioning. **[5]**
b) Discuss Rotating Disc Contactor in detail. **[5]**
Q.5a) Discuss Vaccum Crystallizer **[5]**
b) Define Extraction and discuss which factors shoud be considered while selection of solvent for extraction. **[5]**

OR

Q.5a) Discuss Swenson Walker Crystallizer **[5]**
b) Explain the construction and working of Krystal crystallizer with suitable diagram. **[5]**

Q.6 Write notes on : i) Tunnel Dryer ii) Tray Dryer **[10]**

OR

Q.6 Write notes on: i) Drum Dryer ii) Spray Dryer **[10]**

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