SEAT No._____

SARDAR PATEL UNIVERSITY

[278A21] B.Sc. Industrial Chemistry SEMESTER – VI EXAMINATION –April 2017
Mass Transfer Operations
SUB CODE: US06CICH06

DATE: 7TH April 2017

TIME: 10:00 am to 1:00 pm
TOTAL MARKS: 70

Q. 1 Choose the correct answer. [10]

(1) _____ is the temperature at which a liquid mixture of given composition start to vaporize as temperature increases
(a) Bubble point   (b) Dew point   (c) Feed point   (d) None of these

(2) Distillation is used for separating_____.
(a) L-L mixture   (b) L-G mixture (c) L-S mixture (d) G-G mixture

(3) Which out of the following is the most volatile component.
(a) One with boiling point 40^{0}C
(c) One with boiling point 90^{0}C
(b) One with boiling point 50^{0}C
(d) One with boiling point 100^{0}C

(4) For ceramic products, _____ dryer is used.
(a)Tunnel   (b) Spray   (c) Tray   (d) None of these

(5) Function of flight design in the inside wall of rotary dryer is _____.
(a)To lift the solids
(c) To move in forward direction
(b) To break the lumps of solids
(d) None of these

(6) Drying operation involves the transfer of solute material from _____ phase to gas.
(a)Liquid   (b) Solid   (c) Gas   (d) None of these

(7) In Krystal crystallizer, supersaturation is achieved by _____.
(a)Evaporation (b) Cooling   (c) Adiabatic evaporation   (d) distillation

(8) In gas absorption packing size should not be more than 1/8th of column _____.
(a) Length   (b) Height   (c) Diameter   (d) None of these

(9) Solubility is expressed as parts by weight solute per _____ parts by weight solvent.
(A)50   (b) 100   (c) 110   (d) 10

(10) Liquid extraction involves separation of liquid mixture by using_____.
(a) Insoluble solvent   (b) Solute   (c) Volatility   (d) Boiling point

Q.2   Answer the following.(attempt ten)
(1) Define optimum Relux Ratio [20]
(2) Enlist the limitation of Mc Cabe Thiel method.
(3) Define Relative Volatility
(4) Distinguish between evaporation and drying
(5) Define equilibrium moisture and critical moisture content.
(6) Distinguish between adiabatic dryer and non-adiabatic dryer
(7) Define saturation and super saturation.
(8) State the situations in which the packed columns are well suited
(9) Define channeling in packed columns

(10) Differentiate between extract and raffinate
(11) What are the important characteristics of tower packing?
(12) Differentiate between leaching and liquid extraction

Q.3   With the help of neat sketches, explain the principle of flash distillation and simple distillation   [10]

OR

Q.3   Derive the expression of minimum reflux ratio for distillation   [10]

Q.4   (A) Explain the construction and working of tray drier.
       (B) Explain the construction and working of tunnel drier.   [05]
                                                                     [05]

OR

Q.4   (A) Explain the construction and working of drum drier
       (B) Explain the construction and working of spray drier   [05]
                                                                   [05]

Q.5   (A) Write the construction and functioning of packed column used for gas absorption   [05]
       (B) What factors should be considered while selecting solvent for gas absorption?   [05]

OR

Q.5   (A) Write a note on mechanically agitated vessels used for gas absorption   [05]
       (B) Explain the construction and working of Swenson-walker crystallizer with suitable diagram   [05]

Q.6   (A) Explain the working of Basket extractor with suitable diagram   [05]
       (B) Explain the various factors influencing the rate of extraction in leaching   [05]

OR

Q.6   (A) Explain in briefly the selection criteria for solvent to be used for liquid-liquid extraction   [05]
       (B) With the help of a neat sketch, explain the working of spray column used for liquid-liquid extraction   [05]

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