

UKA TARSADIA UNIVERSITY
Semester – I B.Pharm. University Examination – Jan- 2012

Subject Code: 030020104 Subject Name: Pharmaceutics I (Unit Operations I)

Max. Marks: 70

Instructions:

1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.
5. Draw diagrams/figures whenever necessary.

Section-1

Q-1 (A) Do as directed: **[07]**

- I. Define Filtration.
- II. Explain the term: Filter Cake.
- III. Write formula of relative centrifugal force (RCF).
- IV. Write principle of perforated basket centrifuge.
- V. Define evaporation
- VI. What is entrainment?
- VII. Write the principle of short tube film evaporator

Q-1 (B) Answer the following in brief: (Any 4) **[08]**

- I. How are filter aids used in filtration?
- II. Write Darcy's equation for filtration. List the factors influencing the rate of filtration.
- III. Draw neat and labeled diagram of perforated centrifuge.
- IV. Write applications of centrifugation.
- V. Draw neat and labeled diagram of evaporating still.
- VI. Explain construction of calandria.

Q-2 Answer the following: **[10]**

A) Discuss mechanisms of filtration.

OR

A) Describe construction and working of Rotary drum filter.

B) Describe construction and working of plate and frame filter press.

OR

B) Describe construction and working of a forced circulation evaporator.

Q-3 Answer the following in detail. (Any 2) **[10]**

- A) Write a note on Leaf Filter.
- B) Explain conical disc centrifuge.
- C) Describe Climbing Film Evaporator.

Section-2

Q-4 (A) Do as directed:

[07]

- I. A distillation column containing 13 theoretical stages with a packed height of 10 feet has to be used. Calculate its HETP.
- II. Define Relative humidity.
- III. What do you understand by a column running under total reflux?
- IV. What is specific volume of a moist air?
- V. Write the statement of Dalton's law.
- VI. Define Equilibrium Moisture Content.
- VII. What do you understand by mean free path?

Q-4 (B) Answer the following in brief: (Any 4)

[08]

- I. Comment – “For air of zero humidity the EMC will be zero”.
- II. Suggest a suitable dryer for vaccines and milk products.
- III. Suggest a suitable method for distillation of Vitamin-E and Turpentine oil.
- IV. Liquid mixture of ethanol and water is in equilibrium with a vapor containing ethanol and water at a total pressure of 760 mmHg. A sample of vapour indicates that it contains 3.3 moles of ethanol for every 1.7 moles of water. If the liquid has mole fraction of 0.52 ethanol what is relative volatility?
- V. Enlist all thermodynamic properties of moist air which are represented on a psychrometric chart.
- VI. Write applications of simple distillation.

Q-5 Answer the following:

[10]

- A) Explain Spray Dryer along with its merits, demerits and application.

OR

- A) Granules of paracetamol containing 80 lb of water/100 lb of dry granules are being dried in a conveyer dryer. They dry at a constant rate of 5 lb water /lb.hr, down to a 50% moisture content (0.3lb water evaporated/lb.hr) and then at a rate of proportional to moisture content. Calculate the time required to reach a water content of 1% (0.01lb H₂O/lb dry solid).
- B) Enlist different methods of distillation. Explain any one method in detail.

OR

- B) Explain different types of column used for fractional distillation.

Q-6 Answer the following in detail. (Any 2)

[10]

- A) Compare and contrast Distillation, Drying and evaporation.
- B) Explain Principle, working and application of Lyophilization process.
- C) One hundred moles of a liquid mixture is charged to a distillation unit. The liquid mixture contains 0.20 mole fraction of component 'a'. If the mixture is subjected to a simple batch distillation, what will be the liquid composition be after 8 moles of component 'a' has been removed with vapor? Assume Relative volatility as 1.414.
