



Name :

Roll No. :

Invigilator's Signature :

CS/B.PHARM (OLD)/SEM-7/PT-707/2011-12

2011

PHARMACEUTICAL ENGINEERING

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Write *True* or *False* (any ten) : 10 × 1 = 10
- a) Pasty materials cannot be dried in compartment dryer.
 - b) Freeze drying there is reduction in volume of the material after drying.
 - c) Bound water is the amount of moisture physically bound to the material being dried.
 - d) Wet bulb temperature measures moisture content of air.
 - e) Dew point and wet bulb temperature are same.
 - f) Volatile oil are separated from crude drug by fractional distillation.

7328 (O)

[Turn over



- g) A mixture of alcohol and water can be separated into its components by simple distillation.
- h) For separating individual components in a N-component mixture N-1 fractionating columns are necessary.
- i) Molecular distillation is used in separation of less volatile liquid component.
- j) Rectification is a process in which a series of simple distillation takes place.
- k) During falling rate period, rate of drying cannot be increased by increasing the velocity of air.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

- 2. Recommend a suitable dryer for the following :
 - i) Granular solids
 - ii) Pasty materials
 - iii) Vitamin-B complex
 - iv) Vaccines
 - v) Colloidal solution.
- 3. Explain the principle of fluidized bed drying.
- 4. Describe the important features of humidity charts.
- 5. Draw a humidity chart and give its significance.
- 6. Define the term 'humidity', 'dew point', 'humid heat', 'relative humidity', 'percentage humidity'.
- 7. Describe the working of a refrigerator.
- 8. Describe Raoult's law. What is its significance ?



GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

9. a) What are constant boiling mixtures ? Draw typical boiling diagrams for constant boiling mixtures.
- b) Describe the construction of bubble cap column. What are its specific drawbacks ?
- c) Explain the relevant procedure for the separation of azeotropic mixtures. $5 + 5 + 5$
10. a) Describe the construction and working of a fluidized bed dryer with a neat sketch.
- b) A batch dryer removes water from a solid material at the rate of 30 lb/hr during constant rate period. Under operating conditions, the critical moisture content is 0.5 lb of water/lb of dry solid and the equilibrium moisture content is 0.04 lb of water/lb of dry solid. The curve of drying rate vs moisture content may be assumed to be a straight line during the entire falling rate period. 300 lb of dry solid containing 200 lb of water enters the dryer. How long will be the total drying time required if the final product contains 0.08 lb of water/lb of dry solid ? $7 \frac{1}{2} + 7 \frac{1}{2}$

CS/B.PHARM (OLD)/SEM-7/PT-707/2011-12



11. a) Define Extraction. How can you increase the rate of Extraction ?
- b) Draw a neat diagram and give the construction and working principle of Tower Extractor. 15
12. a) Explain the concept of wet bulb temperature. Explain briefly the wet bulb theory. What are the factors influencing wet bulb temperature ? 10
- b) What is a Refrigerant ? What are the properties of a good refrigerant ? 5
-