CS/B.PHARM (SUPPLE)/SEM-7/PT-707/09
PHARMACEUTICAL ENGINEERING (SEMESTER - 7)

1. .....
Signature of Invigilator

2. .....
Signature of the Officer-in-Charge

Reg. No. | | | | | | | | | | | | | | | |

Roll No. of the Candidate | | | | | | | | | | | | | | | |

CS/B.PHARM (SUPPLE)/SEM-7/PT-707/09

ENGINEERING & MANAGEMENT EXAMINATIONS, JULY – 2009

PHARMACEUTICAL ENGINEERING (SEMESTER - 7)

Time : 3 Hours] [Full Marks : 70

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INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
   b) For **Groups – B** & **C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

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Marks Obtained

	Group – A										Group – B			Group – C				
Question Number																	***Total Marks***	***Examiner's Signature***
Marks Obtained																		

.....

Head-Examiner/Co-Ordinator/Scrutineer

S-53027 (28/07)

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PHARMACEUTICAL ENGINEERING
SEMESTER - 7

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GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

i) At dew point temperature, humidity is

a) 0% b) 50%

c) 100% d) none of these. ☐

ii) Rate of drying is ..... to humidity.

a) directly proportional b) inversely proportional

c) not dependent on humidity d) none of these. ☐

iii) Moisture content of a dried solid is

a) zero

b) 50% on dry basis

c) its equilibrium moisture content

d) its critical moisture content. ☐

iv) Drying involves

a) mass transfer b) heat transfer

c) both (a) and (b) d) none of these. ☐

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v) 'Raffinate' is the extraction phase which remains after separation of extract in

a) liquid-liquid extraction b) solid-liquid extraction

c) continuous extraction d) none of these. ☐

vi) Equilibrium moisture content (E.M.C.) is used in

a) mixing b) drying

c) distillation d) extraction. ☐

vii) Humidification is the process of

a) increasing the moisture in air b) decreasing the moisture in air

c) removal of moisture d) none of these. ☐

viii) 'Rayleigh' equation is used for the analysis of

a) simple batch distillation b) fractional distillation

c) molecular distillation d) azeotropic distillation. ☐

ix) If dry bulb temperature is T_1 and wet bulb temperature is T_2 then

a) $T_1 = T_2$ b) $T_1 > T_2$

c) $T_1 < T_2$ d) $T_1 = 1.39\ T_2$. ☐

x) Freeze drying is related to the phenomenon

a) Sublimation b) Occlusion

c) Amination d) Nitration. ☐

xi) Spray drying technique is suitable for

a) Thermolabile substance b) Milk product

c) Granular sample d) None of these. ☐

xii) Oxidisable materials can be dried in a compartment drier.

a) True b) False. ☐

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GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Describe the construction and working of a fluidized bed dryer. 5

3. What do you mean by free moisture content and bound moisture content ? Write short note on drying rate curve. 2 + 3

4. A rotary dryer is used to dry 35,000 kg/hr of a wet drug containing 5% w/w of water to a water content of 0.2% w/w. Calculate the weight of water removed during drying operation. 5

5. What is the importance of extraction in pharmaceutical industries ? 5

6. Describe the working principle of a dehumidifier. 5

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. Define and explain the terms — humidity, relative humidity, percentage humidity, humid head and humid volume. How a humidity chart can show relationship among the above factors along with temperature ? What is dew point ? How will you use humidity chart for showing dew point, dry bulb and wet bulb temperature ? 5 + 3 + 7

8. Write the principle of fractional distillation. Write short note on the types of down-comers in a rectification column. Draw a schematic diagram of a flash distillation apparatus and describe its working principle. 5 + 5 + 5

9. What do you mean by azeotropic distillation ? Discuss the construction of a bubble cup column. Write a note on packed column used in separation of the binary mixture. $2 + 6\frac{1}{2} + 6\frac{1}{2}$

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10. a) What do you mean by drying ? Sketch a typical drying rate curve for a porous solid and explain the nature of the curve. What is critical moisture content ?

b) With a neat sketch, describe the working principle of a spray drier. What are the advantages of spray drier ? 9 + 6

11. a) Discuss the factors affecting the rate of extraction of active constituent from organized crude drugs.

b) With a neat diagram, describe the design, operation and applications of the Rotocel extractor. 15

END

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