PHARMACEUTICAL ANALYSIS (SEMESTER - 8)

CS/B.Pharm/SEM-8/PT-801/09

1. ....
Signature of Invigilator

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

Reg. No.

Roll No. of the Candidate

CS/B.Pharm/SEM-8/PT-801/09

ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL – 2009

PHARMACEUTICAL ANALYSIS (SEMESTER - 8)

Time : 3 Hours] [Full Marks : 70

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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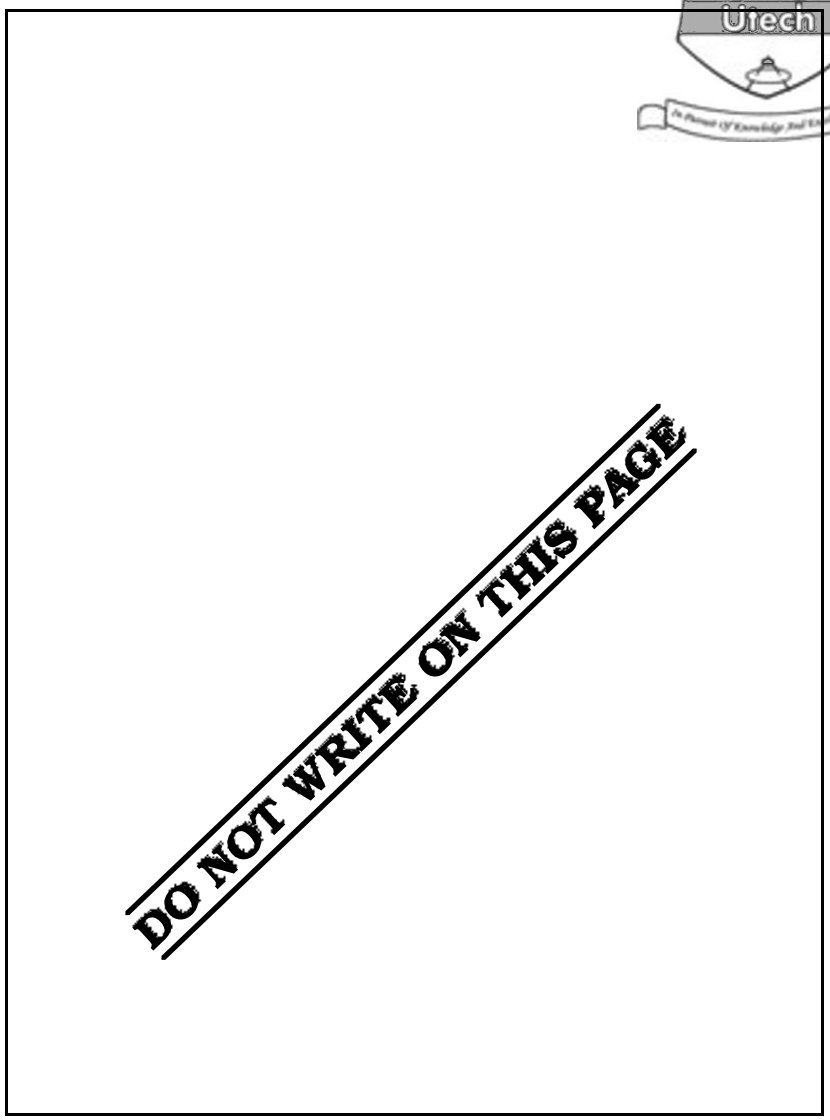
Marks Obtained

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

....

Head-Examiner/Co-Ordinator/Scrutineer

8801 (20/04)



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GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) Which of the following compounds is most likely to have its base peak at m/z = 43 ?

a) $CH_3(CH_2)_4CH_3$ b) $(CH_3)_3CCH_2CH_3$

c) Cyclohexane d) $(CH_3)_2CHCH(CH_3)_2$. ☐

ii) UV-VIS spectroscopy of organic compound is usually concerned with which electronic transition ?

a) σ-σ^* b) η-σ^*

c) π-π^* & η-π^* d) all of these. ☐

iii) For a molecule to absorb IR, why must the molecule's vibrations cause fluctuations in the dipole memento of the molecule ?

a) Because a change in dipole moment lowers the energy required for electronic transitions

b) Because for absorption to occur, the radiation must interact with the electric field caused by changing dipole moment.

c) Because fluctuations in the dipole moment allow the molecule to deform by bending and stretching. ☐

iv) Chemical shift parameter is used in

a) NMR spectroscopy b) IR spectroscopy

c) Mass spectroscopy d) All of these. ☐

v) Retention factor (R_f) in chromatography is used for

a) quantitative purpose b) qualitative purpose

c) preparative purpose d) none of these. ☐

vi) Which one is correct in respect of increasing wavelength ?

a) Cosmic Ray < *X*-Ray < UV < VIS < IR < Microwave < Radiowave

b) *X*-ray < Cosmic Ray < UV < VIS < IR < Microwave < Radiowave

c) Cosmic Ray < UV < VIS < IR < *X*-Ray < Microwave < Radiowave

d) Cosmic Ray < *X*-Ray < UV < VIS < IR < Radiowave < Microwave. ☐

vii) Shielding or screening constant is given by

a) $1 - \frac{H}{H_o}$ b) $1 - \frac{H_o}{H}$

c) $\frac{H}{H_o} - 1$ d) $\frac{H_o}{H} - 1$. ☐

viii) Quantum yield of fluorescence (ϕ) is defined as the ratio of

a) no. of photon emitted to no. of photon absorbed

b) no. of photon absorbed to no. of photon emitted

c) no. of photon emitted to no. of photon adsorbed

d) no. of photon adsorbed to no. of photon emitted. ☐

ix) Which of the following element is most easily detected by Flame Photometry ?

a) Lithium b) Beryllium

c) Sodium d) Cadmium. ☐

x) Finger Print Region lies between

a) 1200-600 cm^{-1} b) 4000-1500 cm^{-1}

c) 1500-400 cm^{-1} d) 400-200 cm^{-1} .

xi) By which of the following methods Riboflavin can be assayed ?

a) UV spectroscopy b) IR spectroscopy

c) Fluorimetry d) Visible spectroscopy.

xii) Stretching vibration involves

a) movement along the axis of the molecule

b) change in bond angle

c) movement along the axis of the bond axis

d) resonance.

GROUP – B

(Short Answer Type Questions)

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

2. Explain briefly spin-spin coupling taking the example of ethanol. 5

3. What do you mean by single or double point standardization ? What is standard addition method ? 3 + 2

4. What are emmission spectroscopy and absorption spectroscopy ? What are the differences between Atomic absorption spectroscopy and Atomic emission spectroscopy ? 2 + 3

5. Write down the principle of Flame Photometry. 5

6. a) Give the wavelength ranges of UV, visible and infrared regions.

b) What is chromophore ?

c) Which type of organic compound show $\sigma \rightarrow \sigma^*$ transitions ? $2 + 1\frac{1}{2} + 1\frac{1}{2}$

7. a) What is molar absorption coefficient ?

b) What is triplet state ?

c) What are the differences between fluorescence and phosphorescence ?

$1\frac{1}{2} + 1\frac{1}{2} + 2$

GROUP – C

(Long Answer Type Questions)

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

8. Give the basic principle of NMR spectroscopy. Explain in detail Chemical Shift and the factors affecting chemical shift in proton NMR spectroscopy. Why TMS is used as reference standard in NMR spectroscopy ? Why is the chemical shift expressed in *ppm* ? $5 + 8 + 1 + 1$

9. How many fundamental vibrations are there in CO_2 and H_2O ? Explain how bond strength and mass of atom are related to vibrational frequency. State the procedure for preparation of solid sample in IR spectroscopy. Describe two sources and two detectors used in IR spectrophotometer. Discuss the advantages of FT-IR over dispersive instrument. What is the utility of FINGERPRINT region ?

$1 + 3 + 3 + 4 + 3 + 1$

10. a) State Beer- Lambert law and deduce the relation A = abc.

b) What is molar absorptivity and $A^{1\%}_{1\ cm}$?

c) Establish the relation $\square = \frac{A^{1\%}_{1\ cm} \propto \text{Molecular weight}}{A_0}$. $8 + 2 + 5$

11. What do you mean by Wavelength ? Write down the principle of UV Spectroscopy. Describe various types of electronic transitions that take place in UV Spectroscopy. Write down the application of UV-Visible Spectroscopy. 2 + 3 + 5 + 5

12. a) What is validation ?

    b) Discuss different types of validation.

    c) Give the requirements to be fulfiled for the compliance of GLP as per the stipulations provided by the regulatory authority.

    d) What is ISO 9000 ? 1 + 3 + 8 + 3

13. a) Give the basic principle behind the fluorimetric assay.

    b) What is the significance of Fingerprint region in IR Spectroscopy ?

    c) What are the limitations of flame photometer ?

    d) How will you estimate riboflavin using photofluorimeter ? 3 + 4 + 4 + 4

END