CS / B.Pharm(N) / SEM-2 / PT-203 / 09

1. ....
Signature of Invigilator

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

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

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

CS / B.Pharm(N)/SEM-2 /PT-203 /09

ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009

PHARMACEUTICAL CHEMISTRY (PHYSICAL CHEMISTRY) (SEMESTER - 2)

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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FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

Group – A **Group – B** **Group – C**

Question Number																	***Total Marks***	***Examiner's Signature***
Marks Obtained																		

....
Head-Examiner/Co-Ordinator/Scrutineer

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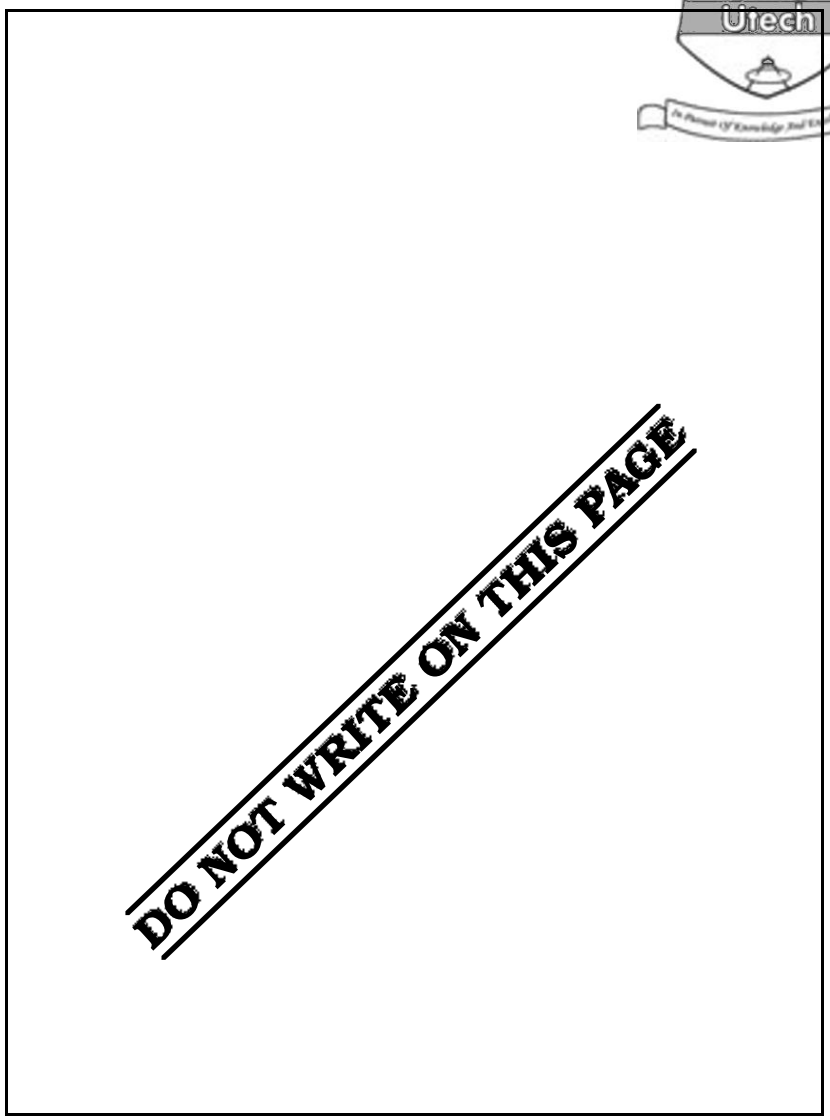

ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009

PHARMACEUTICAL CHEMISTRY (PHYSICAL CHEMISTRY)

SEMESTER - 2

Time : 3 Hours] [Full Marks : 70

GROUP – A

(Multiple Choice Type Questions)

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

i) Unit of coefficient of viscosity is

a) dynes.sec/cm b) dynes/cm^2

c) dynes.sec/cm^2 d) dynes/sec/cm. ☐

ii) Unit of van der Waals constant (*b*) is

a) mole/lit. b) mole

c) lit. d) lit./mole. ☐

iii) Stalagmometer is used to measure

a) viscosity b) surface tension

c) refractive index d) dipole moment. ☐

iv) Expression for spreading coefficient is

a) $W_{Adhesion} - W_{Cohesion}$ b) $W_{Adhesion} + W_{Cohesion}$

c) $W_{Cohesion} - W_{Adhesion}$ d) $W_{Adhesion} / W_{Cohesion}$. ☐

v) Transmittance is the ratio of intensity of

a) incident light to transmitted light

b) transmitted light to incident light

c) incident light to absorbed light

d) absorbed light to transmitted light. ☐

vi) Which type of colloid is thermodynamically unstable ?

a) Lyophobic colloid b) Lyophilic colloid

c) Association colloid d) None of these. ☐

vii) A racemic mixture has

a) Zero optical rotation b) Positive optical rotation

c) Negative optical rotation d) Infinite optical rotation. ☐

viii) The unit of entropy is

a) joule b) kelvin

c) joule/kelvin d) none of these. ☐

ix) Enthalpy change, ΔH of a process is given by the relation

a) $\Delta H = \Delta E + P\Delta V$ b) $\Delta H = \Delta E + \Delta nRT$

c) $\Delta H = \Delta E + W$ d) All of these. ☐

x) Gibbs isotherm is related to

a) absorption b) adsorption

c) both of these d) none of these. ☐

xi) Which of the following is a unit of surface tension ?

a) dyne/cm b) dyne/cm^2

c) dyne-see/cm d) none of these. [ ]

xii) Mathematically phase rule is expressed as

a) P + F + C = 2 b) P + F = C + 2

c) P + F = C – 2 d) P – F = C + 2. [ ]

GROUP – B

(Short Answer Type Questions)

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

2. Write down the postulates of the kinetic theory of gases.

3. a) What do you mean by colloid ?

b) What are the differences between true solution and colloidal system ?

c) What is Tyndal effect ?

d) Define the following :

i) Gold number

ii) Zeta potential. 1 + 1 + 1 + (1 + 1)

4. Write a short note on the pharmaceutical importance of buffers.

5. Define surface tension. Describe the surface tension equation by capillary rise method.

6. What are the differences between physical adsorption and chemical adsorption ? Write a note on Langmuir isotherm.

GROUP – C

(Long Answer Type Questions)

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

7. a) Define angle of contact.

   b) Show that $\cos\theta = \left(\gamma_{as} - \gamma_{ls} \right) / \gamma_{al}$, where γ_{as} = surface tension between air and solid, γ_{ls} = surface tension between liquid and solid, γ_{al} = surface tension between air and liquid.

   c) Benzene at 20°C rises 4·07 cm in capillary tube of radius 0·0165 cm. Calculate the surface tension of benzene. (Density of benzene is 0·88 gm/cc)

   d) Define co-efficient of viscosity. Deduce the relation between viscosity and temperature. (2 + 3 + 4 + 6)

8. a) Define viscosity. What is its unit ?

   b) Write down the Poiseuille's equation.

   c) Name two methods for determination of viscosity. Describe any one method in detail.

   d) Liquid *A* (density 0·7 g/c.c.) flows through a viscometer in 63 sec, while same volume of water requires 108 sec at 20°C. Calculate the viscosity of liquid *A* if that of water is 0·01005 poise at that temperature. [Assume the density of water is 1 g/c.c.].

   e) How does the viscosity of liquid vary with temperature ?

   $\left(1\frac{1}{2} \right) + 1 + \left(1 + 4\frac{1}{2} \right) + 5 + 2$

9. a) Define absorption and adsorption with suitable examples.

   b) What are the applications of adsorption in pharmacy and allied fields ?

   c) Deduce Freundlich adsorption isotherm.

   d) State and explain Gibbs' adsorption isotherm. 3 + 4 + 4 + 4

10. a) Write short notes on the following :

i) Helmholtz free energy or work function.

ii) Gibbs' free energy.

b) Define second law of thermodynamics.

c) What is Carnot cycle ? With the help of it, prove that the mathematical form of second law is $W = Q\frac{\Delta T}{T}$ where, W = work, Q = Heat and T = Temperature.

6 + 2 + 7

11. a) A drop of water 0·8 cm in diameter is split into 125 tiny drops. Find the increase of surface energy (surface tension of water = 72 dyne/cm).

b) Write short notes on any *two* of the following : 3 + (2 × 6)

i) Entropy

ii) Free energy and work function

iii) Acid, base and buffer.

END