



Name :

Roll No. :

Invigilator's Signature :

CS/B.Pharm (NEW)/SEM-2/PT-203/2010

2010

PHARMACEUTICAL CHEMISTRY (PHYSICAL CHEMISTRY)

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. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10
- i) Stalagmometer is used to determine
 - a) Viscosity
 - b) Refractive index
 - c) Surface tension
 - d) None of these.

 - ii) Angle of contact (θ) for mercury on glass is
 - a) $\theta > 90^\circ$
 - b) $\theta < 90^\circ$
 - c) $\theta = 0^\circ$
 - d) $\theta = 180^\circ$.

2011

[Turn over



iii) Half life of a zero order reaction is given by

- a) $\frac{1}{ak}$
- b) $\frac{0.1a}{k}$
- c) $\frac{a}{2k}$
- d) $\frac{0.693}{k}$.

iv) Which of the following is not a colligative property ?

- a) Boiling point
- b) Freezing point
- c) Vapour pressure
- d) Refractive index.

v) If molecular weight of solute A is M_A & its equivalent weight is E_A , then 1 M solution of A means

- a) A_A gm of A in 100 ml solution
- b) M_A gm of A in 1000 ml solution
- c) E_A gm of A in 1000 ml solution
- d) M_A gm of A in 1000 ml solvent.

vi) Milk is a colloidal system of which type ?

- a) Liquid – liquid
- b) Liquid – solid
- c) Solid – liquid
- d) None of these.



- vii) The change in entropy of a reaction is given by
- $\Delta S = \sum S_{\text{reactants}} + \sum S_{\text{products}}$
 - $\Delta S = \sum S_{\text{products}} - \sum S_{\text{reactants}}$
 - $\Delta S = \sum S_{\text{reactants}} - \sum S_{\text{products}}$
 - None of these.
- viii) The unit of viscosity is
- dyne .cm⁻² .sec
 - dyne .cm⁻² .sec⁻¹
 - dyne⁻¹ .cm⁻² .sec
 - dyne .cm⁻¹ .sec.
- ix) A thermos flask is an example of
- isolated system
 - closed system
 - open system
 - homogeneous system.
- x) At constant temperature if the pressure of an ideal gas is increased three times, the volume will
- reduce to half
 - increase to double
 - reduce to one-third
 - none of these.



5. a) Write down 'Nernst Distribution Law.'
 b) Show that 'multiple extraction is much more effective than single extraction'. $1\frac{1}{2} + 3\frac{1}{2}$
6. Define the following terms : 5×1
- a) Transport Number
 b) Degree of Dissociation
 c) Equivalent Conductance
 d) Faraday
 e) Cell Constant.

GROUP – C

(Long Answer Type Questions)

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

7. a) What are the differences between absorption & adsorption ? Explain with example.
 b) Discuss the application of adsorption.
 c) Deduce Freundlich adsorption isotherm.
 d) Describe the mechanism of physical & chemical adsorptions. $3 + 4 + 4 + 4$
8. a) Define colloids. How are they classified ?
 b) Explain the stability of colloids.
 c) Define Gold number & explain why Alum is used in town water supply.
 d) What do you mean by the term 'Peptization, Sol & Gel' ?
 e) Compare the Lyophilic & Lyophobic sols with examples.

$1 + 2 + 3 + 1 + 2 + 1 + 1 + 1 + 3$



9. a) What is Activation energy ?
- b) Derive mathematical expression for the rate constant of a reaction ($A \rightarrow \text{Products}$) of the 1st order & also determine the half life & shelf life.
- c) What is Acid-base & Enzyme catalysis ? Write down some characteristics of catalytic reactions.
- d) For a certain first order reaction $t_{0.5}$ is 100 sec. How long will it take for the reaction to be completed 75% ?
- e) Define chemical adsorption. Give examples

1 + 3 + 1 + 1 + 3 + 3 + 1 + 2

10. a) Determine the rate constant for first order reaction.
- b) A solution of a drug contained 500 units per ml when prepared. It was analyzed after a period of 40 days and was found to contain 300 units per ml. Assuming the decomposition as first order, at what time will the drug have decomposed to one half of its original concentration ?
- c) What is the rate expression for zero order reaction ?
- d) What is pseudo first order reaction ?
- e) Show that $t_{\frac{1}{2}}$ for first order reaction is independent of initial concentration.
- f) Write down Arrhenius equation showing the influence of temperature on reaction rate.

4 + 5 + 1 + 2 + 2 + 1



11. a) Deduce the following equation from kinetic theory :

i) $C_V = \frac{3}{2} R + X$

ii) $C_P = \frac{5}{2} R + X$

C_V & C_P are the heat capacities.

b) Derive Boyle's law & Charles law from kinetic theory.

c) What are the deviations of ideal gas ? 9 + 3 + 3

=====