



Name :

Roll No. :

Invigilator's Signature :

**CS/B.Pharm(N)/ SEM-3/PT-306/2012-13
2012**

PHARMACEUTICS (PHYSICAL PHARMACY)

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) Which of the following describes the gaseous state of matter ?
- a) A gas has both a definite shape and volume
 - b) A gas has a definite shape but not a definite volume
 - c) A gas has a definite volume but not a definite shape
 - d) A gas has neither a definite shape nor volume.

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- ii) The maximum temperature at which the two-phase region exists in a mixture of two partially miscible liquids is known as
- upper consolute temperature
 - lower consolute temperature
 - critical temperature
 - Kraft point.
- iii) Which of the following properties are not shared by crystalline solids and amorphous solids ?
- Definite shape
 - Definite volume
 - Incompressibility
 - Definite melting point.
- iv) Which one of the following apparatus is used to determine the particle size by the gravity sedimentation method ?
- Pycnometer
 - Ostwald viscometer
 - Andreasen pipette
 - Coulter counter.

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- v) When the cumulative per cent frequency is plotted on the probability scale against the logarithm of the particle size, the 50% value on the probability scale gives the particle diameter.
- a) Harmonic mean b) Geometric mean
- c) Arithmetic mean d) Geometric mode.
- vi) A pile of granules under test has given the base of 9.2 cm diameter and height of 3.6 cm. What is the angle of repose of the granules ?
- a) 38.05° b) 48.05°
- c) 92.35° d) 108.52°.
- vii) Ethylene diamine tetraacetic acid (EDTA) is an example of ligand type
- a) Bidentate b) Hexadentate
- c) Tetradentate d) Unidentate.
- viii) Deflocculated suspension with high concentration of the dispersed solids exhibits the flow of type
- a) dilatant b) Newtonian
- c) pseudoplastic d) plastic.

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ix) Which one is a complexing agent used to increase aqueous solubility of drugs ?

- a) Benzoic acid
- b) Methyl paraben
- c) Tween 80
- d) Caffeine.

x) Which one is not an emulsion ?

- a) Hydrous wool fat
- b) Cold cream
- c) Anhydrous lanoline
- d) Cream.

xi) The kinetic of drug decomposition in a suspension follows

- a) second order
- b) first order
- c) zero order
- d) pseudo zero order.

xii) The effect of the valence of an electrolyte on the double layer repulsive forces is explained by

- a) DLVO theory
- b) Hofmeister series
- c) Schulze-Hardy rule
- d) Donnan membrane effect.



xiii) The rapid increase in solubility of a surfactant solution above a definite temperature is known as

- a) Cloud point
- b) Krafft point
- c) Critical miceller concentration
- d) Triple point.

GROUP - B

(Short Answer Type Questions)

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

2. Give the differences between flocculated and deflocculated suspensions. Mention the factors that influence the rate of sedimentation of suspended drug particles in a suspension.

3 + 2

3. Write a short note on shear-thinning system with an example.

4. How is particle size distribution important in the following :

- a) The process of filtration
- b) Stability of suspension
- c) Bioavailability of drug.

5. How is drug stabilized against oxidation ? Explain with proper example.

6. What is HLB-value ? How is it important in selection of surfactant ?

1 + 4

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GROUP - C
(Long Answer Type Questions)

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

7. a) The time for water to flow through Ostwald viscometer is 292.5 seconds. The density of water at 20°C is 0.9982 gm/ml and viscosity is 1.002 cps. The density of olive oil is 0.910 gm/ml and its viscosity is 100 cps. How long will olive oil take to flow through Ostward viscometer at 20°C ?
- b) Write the principle and working of Ostwald viscometer.
- c) Give pharmaceutical application of polymer. $5 + 5 + 5$
8. a) Define complexation. With the help of suitable examples, describe the following :
- i) Metal complexes
- ii) Organic molecular complexes
- iii) Occlusion complexes
- b) How can the binding of the drugs to proteins influence their action ? Deduce the equation for Scatchard plot for drug-protein interaction. $(5 + 5) + 5$
9. a) What is meant by 'Order of reaction' ?
- b) Give the derivation of rate constant, half-life and shelf life of a first order reaction.

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- c) The initial concentration of a drug which decomposes according to first order kinetics is 97 units/ml. The specific decomposition rate obtained from an Arrhenius plot at 25°C is $2.08 \times 10^{-5} \text{ hr}^{-1}$. Previous experiments have shown that when the concentration falls below 70 units/ml, the product is not fit for use. What expiry date should be assigned to the product ?
- d) Mention the limitations of accelerated stability analysis.

1 + 6 + 4 + 4

10. a) Explain the concept of electrical double layer. Define Zeta & Nernst Potential. 8 + 2
- b) What is Faraday-Tyndall effect observed in colloids ? 5
11. Define polymer. Give pharmaceutical application of polymer. Write a short note on gel formation conservation and microencapsulation.

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