Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.PHARM(NEW)/SEM-3/PT-306/2011-12

2011

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) Falling sphere viscometer is ..... viscometer.

   a) single point b) multipoint

   c) stormer d) cone and plate.

   ii) The HLB range of emulsifier used in the preparation of water in oil emulsion is

   a) 4 to 6 b) 7 to 12

   c) 13 to 15 d) 16.

   iii) The property of drug molecules that is usually modified by complexation is

   a) particle size b) particle shape

   c) solubility d) all of these.

   iv) Which one of the following apparatus is used to determine the particle size by the gravity sedimentation method ?

   a) Pycnometer b) Ostwald viscometer

   c) Andreasen apparatus d) Friabillator.

v) When a strong beam of light is passed through a colloidal solution, a visible cone is formed due to scattering of light. This phenomenon is known as

a) Brownian motion b) Tyndall cone effect

c) Colloidal cone effect d) Streaming motion.

vi) For an ideal suspension, the sedimentation volume should be

a) equal to one b) less than one

c) more than one d) zero.

vii) Flocculated suspension exhibits the flow of a .....type

a) Dilatant b) Newtonian

c) Plastic d) Pseudoplastic.

viii) The protective property of a colloid is expressed in terms of

a) HLB value b) molecular weight

c) amphophilicity d) gold number.

ix) Olefin complexes are formed by all of the metal ions *except*

a) platinum b) iron

c) magnesium d) mercury and silver.

x) The supernatant liquid in a deflocculated suspension is

a) clear b) turbid

c) transparent d) yellow.

xi) Fluidity is a term associated with Newtonian fluids. An equivalent term in plastic flow fluids is

a) apparent viscosity b) flexibility

c) mobility d) plastic viscosity.

xii) Creep test is applied to evaluate the viscoelastic properties of

a) ointments b) suspensions

c) emulsions d) lotions.

GROUP – B

(Short Answer Type Questions)

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

2. With the help of a neat phase diagram, explain the principle of sublimation.
3. Define the term 'thixotropy' and explain how you would determine thixotropy.
4. Define polymorphism. Give 3 examples of the pharmaceutical applications of polymorphs.
5. Write a short note on liquid crystals.
6. The initial stage of decomposition for a new drug according to a consecutive reaction was found to be first order. The reaction rate constants at 40°C and 20°C are 0·120 hr^{-1} and 0·0020 hr^{-1} respectively. What is the activation energy and Arrhenius factor "*A*" for the reaction ?

GROUP – C

(Long Answer Type Questions)

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

7. a) Define bulk volume, granular volume and true volume.

   b) Give two methods for determination of true volume of a powder sample. Mention their limitation, if any.

   c) Discuss the factors affecting flow property of granules in brief.

   d) The true volume of a given powder sample is 0·3 ml. The volume of intraparticle pores and interparticle spaces are 0·1 ml and 0·9 ml respectively. Compute granular volume, bulk volume, total porosity and intraparticle porosity.

   3 + 5 + 3 + 4

8. a) Derive an equation for the determination of surface tension of a liquid by the capillary rise method.
   b) Define adsorption isotherm. Draw various types of adsorption isotherms and explain their behaviour.

$7\frac{1}{2} + 7\frac{1}{2}$

9. a) With relevant mathematical equation, give the construction, working and applications of cup and bob viscometer. What are its advantages ?
   b) A plastic material was found to have a yield value of 5200 dynes/cm^2. At shearing stress above the yield value, F was found to increase linearly with G. If the rate of shear was 150 sec^{-1} when F was 8000 dynes/cm^2, calculate u, the plastic viscosity of the sample. 10 + 5

10. a) Write notes on "Interfacial properties of suspended particles".
    b) Describe 'phase imversion' as a stability factor of emulsion.
    c) In general w/o emulsion show upward creaming – True or false. Justify.
    d) Define critical micelle concentration and explain the factors affecting formation of micelles.

4 + 3 + 3 + 5

11. a) Explain the concept of electrical double layer. Define Zeta & Nernst Potential.
    b) What is Faraday Tyndall effect observed in colloids ?

(8 + 2) + 5