Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/B.PHARM(OLD)/SEM-3/PT-306/2009-10

2009

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 :

$10 \times 1 = 10$

i)   The Biological half life of a Drug following First order kinetics is represented by

   a) $1/k$ b) $\log k$

   c) $0{\cdot}693/k$ d) $2{\cdot}303/k.$

ii) The accelerated stability tests are valid only when energy of activation of a chemical reaction is

   a)   less than 10 k cal/mol

   b)   10 to 30 k cal/mol

   c)   30 to 70 k cal/mol

   d)   more than 70 k cal/mol.

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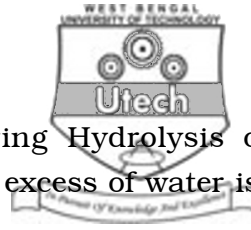
iii) The order of reaction followed during Hydrolysis of Ethyl acetate in presence of acid and excess of water is

    a) Zero order   b) First order

    c) Pseudo First order   d) Second order.

iv) Flocculated suspensions have .... sedimentation volume than that of Deflocculated suspensions.

    a) Higher   b) Lower

    c) Equal   d) Zero.

v) Aqueous starch mucilage in water is an example of

    a) Hydrophilic colloids   b) Hydrophobic colloids

    c) Lipophilic colloids   d) Association colloids.

vi) Brooke-Field viscometer is an example of .... Viscometer.

    a) Rotating Sphere   b) Rotating Spindle

    c) Cone & Plate   d) Cup & Bob.

vii) For Newtonian fluids, the slope in a rheogram is

    a) zero   b) 1

    c) -1 d) $\frac{1}{2}$.

viii) High angle or Repose of Granules indicates

    a) Smooth surface of spherical granules

    b) Rough surface of irregular shaped granules

    c) High bulk density of granules

    d) Very good flow properties.

ix) The sedimentation of caking in a suspension can be minimized by

    a) increasing particle size of dispersed particles

    b) increasing viscosity using a structured vehicle

    c) assisting to form flocculated particles

    d) utilizing all of the above methods.

x) The instrument for measuring Particle Volume is

    a) Coulter counter   b) André ason Pipette

    c) Hempel Burette   d) Helium Densitometer.

xi) Eutectic mixture is a mixture of two compounds with

    a) sharp melting point higher than those of individual compounds

    b) sharp melting point lower than those of individual compounds

    c) sharp melting point equal to those of individual compounds

    d) bulk density equal to those of individual compounds.

xii) Amorphous form of a drug dissolves .... than the crystalline form.

    a) faster   b) slower

    c) equally   d) not at all.

GROUP – B

(Short Answer Type Questions)

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

2. Discuss the effect of Particle Shape & Size, Moisture and Porosity on the Flow properties of Powders. How is it related to Angle of Repose ? How do Glidants work to reduce angle of Repose ?

3. In a tabular form compare the characteristics of Physical adsorption & Chemisorption.

4. Derive expressions to calculate rate constant and half life for Zero order and First order chemical reactions.

5. Write notes on the following :
    i)   Brownian Motion & Light Scattering
    ii) Thixotropy in Plastic & Pseudo plastic systems.

6. Give at least five applications of Complexation in Pharmaceutical formulations with examples.

GROUP – C

(Long Answer Type Questions)

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

7. What are the objectives of Accelerated Stability Analysis ? Describe in detail how Shelf-life at Room Temperature is predicted by Arrhenius Plot. What are its limitations ?

8. Discuss the concept of Controlled flocculation in structured vehicle approach in the formulation of stable suspensions with examples. What is the importance of wetting of particles ?

9. Define critical micelle concentration (cmc) and explain micelle formation. Distinguish between the properties of Lyophobic, Lyophilic and Association colloids.

10. a) The rate constant (k_1) for the decomposition of 5-hydroxy methyl furfural at 120°C is 1·73 hr^{-1} and (k_2) at 140°C is 4·860 hr^{-1} .What is the Activation energy (E_a) in k cal/mol and the Frequency factor (A) in sec^{-1} for the breakdown of 5–HMF within the temperature range ?

    [Given R = 1·987 cal/degree.mol].

    b) The weight of sodium iodide tablet is 0·356 g and the bulk volume of the tablet is 0·1 c.c. The true density of Sodium iodide is 3·667 g/c.c. What are the bulk density and total porosity of the tablet ?

    c) What is the specific surface of the particles of a sulphathiazole powder having a particle density of 1·5 g/c.c. and an average diameter d_{vs} of 2 μm ?

    Assume that the particles are true spheres.

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