Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.PHARM/SEM-2/MPT-206(2)/2011

2011

PHYSICAL PHARMACEUTICS

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) Kraft point is the temperature

a) above which the solubility of a surfactant rises sharply

b) at which solubility of the surfactant becomes equal to the CMC

c) both (a) & (b)

d) above which the solubility of a surfactant declines rapidly.

ii) Mixing, granulation and drying can be carried out in a single operation for the production of granules by

a) Little ford MGT granulator

b) Merumizer

c) Single pot mixing granulator MGT-S

d) Little ford Lodgie granulator.

iii) In Coulter counter as particles travel through the orifice the event that occurs is

a) conductance between the electrodes increases

b) transmittance between the electrodes decreases

c) resistance between the electrodes increases

d) resistance between the electrodes decreases.

iv) High angle of repose of the granules indicates

a) Smooth surface of granules

b) Rough surface of granules

c) High bulk density of granules

d) High porosity of granules.

v) Sauter mean diameter can be expressed by

a) $\sum nd^3 / \sum nd^2$ b) $\sum nd^4 / \sum nd^3$

c) $\sum nd^2 / \sum nd$ d) $\sum nd^3 / \sum n$.

vi) The principal limiting factor in the rate of absorption from suspensions is

a) Viscosity b) Dissolution rate

c) Physical stability d) Chemical stability.

vii) Which of the following agents may stain clothing when used topically ?

a) PABA b) PAS

c) Zinc oxide d) Undecynic acid.

viii) If a drug has biological half-life of 6.9 days, the best dosing interval would be

a) daily b) qid

c) biweekly d) weekly.

ix) An IV order requires 5 million units of sodium penicillin *G* to be aded to 1 litre of normal saline. How many mEq of sodium are available per litre of sodium ?

a) 8.4 b) 154

c) 162 d) 1620.

x) Needle-shaped crystals are frequently formed on the suface of aspiring on long standing due to decomposition. The substance formed is

a) CH_3 COOH b) C_6 H_4 (OH) COOH

c) C_6 H_5 OH d) C_6 H_4 $(OH)_2$.

xi) The minimal flow rate of air in laminar flow hoods should be not less than how many cubic feet/minute ?

a) 10 b) 50

c) 100 d) 500.

xii) Carr Index is indicator for

a) Hardness of granules

b) Flow property of granules

c) Compressibility of the granules

d) both (b) & (c).

GROUP – B

(Short Answer Type Questions)

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

2. Write a note on the tablet press.

3. What is dissolution profiling ? How and why is it performed routinely for solid oral dosage form development ?

4. Describe the role of a surfactant in a ternary system using 3-phase diagram.

5. Discuss compression and cohesive properties of binary mixtures using "Kawakita equation" and "angle of internal flow" and write the importance of these characteristics in actual practice.

6. Describe liquid displacement method for determining true density of powders.

GROUP – C

(Long Answer Type Questions)

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

7. a) Define Association colloids and its role in the context of pharmaceutical aspects of solubilization.

   b) The release fraction F of a drug from a gel with time is F (%) is 31.5 in 100 min. Compute the diffusional exponent *n* of the general equation

   $F = M_t/M_o = Kt^n$ (*k* is given as K = 1.25% min^{-n})

   Does the release follow a Fickian model ? 10 + 5

8. a) Write an account on the following modern granulation techniques : $4 \times 2\frac{1}{2} = 10$

   i) Melt granulation technology

   ii) Moisture-activated dry granulation

   iii) Freeze granulation technology

   iv) Pneumatic dry granulation.

   b) Write a brief account on tablet coating techniques, problems and remedies. 5

9. What do you mean by hydrogel ? Describe their role in drug delivery. How will you determine swollen index and deswollen index ? Derive expressions for release kinetics of drug from hydrogel. 2 + 4 + 6 + 3

10. Write explanatory notes on any *three* of the following : 3×5

   a) Mechanisms of solubilization of poorly soluble drugs in aqueous system.

   b) BET method for the determination of specific surface area.

   c) Sedimentation technique for particle size analysis and limitations of Stokes' law.

   d) Dissolution study for suppositories and suspensions.

11. How do you determine the purity of the chemicals by DSC method ? What is the effect of increase pressure of 1 atm on the freezing point of water, where molar volume of water is 18.018, Molar volume of ice is 19.651, ΔH_f = 1440 cal/mol ? $7\frac{1}{2} + 7\frac{1}{2}$