MALIBA PHARMACY COLLEGE, TARSADI
B. PHARM. SECOND SEMESTER
MID SEMESTER EXAMINATION MARCH 2009
Physical Pharmacy (220006)

DATE : 30/03/09 TIME : 12:30 p.m. to 3:30 p.m.
MAXIMUM MARKS : 100

Instructions:
1. Attempt any five questions. Que. No. 1 is compulsory
2. All questions carry equal marks.

Q – 1: Attempt any TEN from the followings: [20]

a. Define Latent heat of fusion and vapor pressure.
b. Comment with reason: The balance of enthalpy, entropy and temperature determines spontaneous changes in states of matter.
c. Explain velocity gradient and shearing stress.
d. What are the advantages of cone and plate viscometer over cup and bob viscometer?
e. Viscosity of acetone at 25^0C is 0.313 centipoise and its density at same temperature is 0.788g/cm^3. Find its kinematic viscosity.
f. What is the difference in dilatancy and negative thixotropy?
g. Define and classify pharmaceutical suspensions.
h. Define specific viscosity and intrinsic viscosity.
i. Why suspended particles have tendency to flocculate?
j. Calculate the change in pH of water when 1 ml of 0.1N HCl is added to 99ml of pure water.
k. Calculate pH of 0.1M NH_3 solution. Kb of $NH_3 = 1.8 \times 10^{-5}$.

Q – 2: Answer the following:

a. Explain Critical solution Temperature with example. Show the calculations of compositions on tie line. **[10]**

b. Draw the phase diagram of two-component system containing solid and liquid phases. Explain the regions in the phase diagram. Show the calculations of conjugate phases at different temperatures. Give definition of eutectic point and examples of eutectic mixtures. **[10]**

Q – 3: Answer the following:

a. Explain sublimation with phase diagram and examples. Define triple point and write its importance. **[5]**

b. Explain temperature dependence of viscosity with suitable equation. Write the relationship of energy of activation and energy of vaporization and its effect on viscosity. **[5]**

c. Write applications of pharmaceutical suspensions. **[5]**

d. Discuss particle interactions in suspension with potential energy curve. **[5]**

[PTO]

Q – 4: Answer the following:

a. Distinguish between the types of Non Newtonian Systems according to their characteristics, equations and examples. **[10]**

b. Define thixotrpy. Draw thixotropic rheograms of shear thinning systems. Why the previous history of the sample has significant effect on thixotropic behaviour? **[5]**

c. Give principle, diagram, procedure and applications of cup and bob viscometer. Discuss plug flow. **[5]**

Q – 5: Answer the following:

a. A plastic system was analyzed in the cone-plate viscometer. Following data were found out. T = 100, v = 150, c = 1.168 Tf = 23 at rpm = 0. Find out plastic viscosity of the system. **[4]**

b. A plastic material has yield value of 1700 dyne/cm^2. If the rate of shear was 130/sec, when the shearing stress was 7000 dyne/cm^2, calculate plastic viscosity. **[3]**

c. The time for water to flow through Ostwald viscometer is 270 sec. The density of water at 20^{0}C is 1.0 g/cc and viscosity is1.0 cp. The density of liquid paraffin is 0.90g/cc and viscosity is 150 cp. How much time liquid paraffin will take to flow through Ostwald viscometer at 20^{0}C. **[4]**

d. Write short notes on the following: **[9]**

i) Glassy state
ii) Inhalers
iii) Liquid crystals

Q – 6: Answer the following:

a. Define buffer solution. **[1]**

b. Enlist different compositions of buffer solutions. **[3]**

c. Explain principle and mechanism of buffers. **[4]**

d. Derive Handerson-Hasselbatch or buffer equation for weak acid & its salt and weak base & its salt. **[4]**

e. The pH of a buffer solution containing 0.5 moles/lit of CH3COOH and 0.5 moles/lit CH3COONa has been found to be 4.76. What will be the pH of this solution after 0.1 moles/lit HCl has been added to buffer? Assume that volume is unchanged. Ka = 1.75 X 10^{-5}. **[4]**

f. Calculate concentration of sodium formate HCOONa that must be required in a 0.1M solution of formic acid to produce a pH of 3.80.
Ka for formic acid = 1.8 X 10^{-4}. **[4]**

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