B.Pharm, Sem-I CBSGS/PP-I

Date - 11-12/15

Q.P. Code : **21719**

(3 Hours) [Total Marks : 70

N.B. : (1) **All** questions are **compulsory.**
(2) **Draw neat** labelled **diagrams** wherever **necessary.**

1. (a) What is super critical fluid state and give it's applications. 3
(b) Define specific rotation and give its application in pharmacy. 3
(c) 12.5gm solute in 170gm water elevate its boiling point by 0.63K. Find its molecular weight if $K_b = 0.52K/m$. 3
(d) Give the defination, application and limitations of thermodynamic. State the different types of thermodynamic systems. 4
(e) Discuss the variation of equivalent conductance with dilution. 3

2. (a) Explain any one method of liquefaction of gases. 4

OR

(a) (i) "Liquefaction of CO_2 is easier than that of H_2." State true or false and justify.
(ii) Discuss working of Aerosols.
(b) Define Dipole moment. Write it's applications. 3
(c) (i) State and explain Kirchoff's equation. 4
(ii) Write a short note on - Bond energy.

3. (a) State Raoult's law. Explain Ostwald and Walker's dynamic method for measuring the relative lowering of vapour pressure. 4
(b) The resistance of a N/10 solution of a salt is found to be 2.5×10^3 ohms. Calculate the equivalent conductance of the solution. (cell constant = $1.15 cm^{-1}$). 3
(c) Explain the efficiency of heat engine. Calculate the maximum efficiency of an engine operating between 110°C and 25°C. 4

OR

(c) Answer the following :
(i) State third law of thermodynamics.
(ii) Define chemical potential.
(iii) State Gibbs Helmholtz equation.
(iv) Define free energy.

4. (a) How and why real gases deviates from ideal behaviour. Derive vander waal's equation for 'n' moles. 4
(b) Define molar refraction. Discuss applications of Abbe's refractometer. 3
(c) Describe a method to determine elevation in boiling point of a non-volatile solute in solution wih the help of a neat labelled diagram. 4

OR

(c) Describe a method to determine depression in freezing point of a non-volatile solute in solution with the help of a neat labelled diagram.

5. (a) Write a short note on Polymorphism. 4
(b) State and explain Clausius Clapeyeron equation and Vant Hoff equation. 3
(c) Calculate ΔH for the following reaction: 4

$$C_2H_{4(g)} + 3O_{2(g)} \rightarrow 2\,CO_{2(g)} + 2H_2O_{(g)}$$

from the following values of bond energies.

C - H - 414
O = O - 499
C = O - 724
O - H - 460
C = C - 619

OR

(c) What is osmotic pressure? Explain Berkeley and Hartley's method for measurement of osmotic pressure.

6. (a) The vander waal's constant for ethane are 3

a = 5.57, b = 0.064

Calculate the external pressure and internal pressure for ethane at 300K. The volume of ethane is 2.5m^3/Kmol and R = 8.3153KJ/Kmol.K.

(b) Write a short note on steam distillation. 3
(c) Define entropy. State and explain second law of Thermodynamics. 3
(d) State the postulates of Arrhenius theory of electrolytic dissociation. 2
