

Roll No.

Total No. of Pages : 02

Total No. of Questions : 10

**B.Pharma. (Sem.-2)**  
**PHARMACEUTICAL CHEMISTRY-II (Physical Chemistry)**

Subject Code :BPHM-202

M.Code :46212

Date of Examination : 06-07-22

Time : 3 Hrs.

Max. Marks : 80

**INSTRUCTION TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of FIFTEEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains FOUR questions carrying TEN marks each and students have to attempt any THREE questions.

**SECTION-A**

**1. Explain in brief :**

- a. Define the Hamiltonian and Laplacian operator.
- b. How does chemisorption vary from physisorption? Discuss the factors which influence the adsorption of a gas on a solid.
- c. What is meant by the terms rate constant and order of a reaction?
- d. Write two characteristics each of homogeneous and heterogeneous catalysis.
- e. Write the Michaelis-Menten equation governing kinetics of enzyme catalyzed reactions.
- f. Explain Lambert-Beer law for light absorption by solutions.
- g. What is chemiluminescence?
- h. Draw the phase diagram for the water system. Hence also define triple point of water.
- i. Define the Joule-Thomson coefficient. Show that it is zero for an ideal gas.
- j. What are colligative properties? Give examples.
- k. Define the terms :
  - i. Viscosity
  - ii. Surface Tension

- l. Define Raoult's law.
- m. Write Van der Waals equation of state.
- n. Explain Graham's law of diffusion for ideal gases.
- o. State the principle of equipartition of energy.

### SECTION-B

2. Write the various postulates of Quantum Mechanics.
3. Using the expression for the Maxwell Distribution law for velocities, draw the distribution at three different temperatures and comment upon the shapes of the distribution curves.
4. Draw the Jablonski diagram for various radiative and non-radiative photophysical processes.
5. Describe the Debye-Huckel Theory for strong electrolytes.
6. Prove that  $C_p - C_v = RS$

### SECTION-C

7. Set up and solve Schrodinger wave equation for a particle in one dimensional box.
8. A monochromatic radiation is incident on a solution of 0.05 molar concentration of an absorbing substance. The intensity of radiation is reduced to one-fourth of the initial value after passing through 10cm of the solution. Calculate the molar extinction coefficient of the substance.
9. Discuss briefly Langmuir's unimolecular theory of adsorption. Derive an expression for Langmuir's adsorption isotherm.
10. Define half-life time of a reaction. Also, write expression for  $t_{1/2}$  for first order, second order and nth-order reaction.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**