

**P-70**

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Roll No. ....

## **MSCCH-508**

### **Physical Chemistry-II**

M.Sc. Chemistry (MSCCH)

2nd Semester Examination, 2023 (June)

**Time : 2 Hours]**

**Max. Marks : 70**

**Note :** This paper is of Seventy (70) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein. Candidates should limit their answer to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

### **SECTION-A**

#### **(Long Answer Type Questions)**

**Note :** Section 'A' contains Five (05) long answer type questions of Nineteen (19) marks each. Learners are required to answer any Two (02) questions only.

(2×19=38)

1. Explain the principle of determination of surface area of adsorbent using BET equation.

2. (i) What is Schrödinger wave equation derive it and explain its significance?  
(ii) What do you mean by Orthogonality of wave function?
3. (i) Define the classification of Polymers by various ways.  
(ii) Write down the various application of Polymers.
4. What are the main postulates of Langmuir adsorption isotherm? Derive Langmuir Adsorption isotherm and Why is Langmuir adsorption isotherm obeyed only under low pressure and moderate temperature?
5. Why is harmonic oscillator linear? What is the Potential Energy of linear harmonic oscillator?

## **SECTION-B**

### **(Short Answer Type Questions)**

**Note :** Section 'B' contains Eight (08) short answer type questions of Eight (08) marks each. Learners are required to answer any Four (04) questions only. (4×8=32)

1. Define de Broglie's Equation with proper derivation.
2. Write Viscometry method for the determination of molecular weight of polymer.

3. What is the mechanism of heterogeneous catalysis? Explain with the help of suitable example.
  4. (i) Write the Physical significance of  $\psi$  and  $\psi^2$ ?  
(ii) An electron is confined in one dimensional box of length  $1\text{\AA}$ . Calculate its ground state energy in electron volts (eV).
  5. Outline the weaknesses of Bohr's model of atom.
  6. Write a short notes on :
    - (i) Eigen-values.
    - (ii) Eigen- function.
  7. (i) Why  $\text{He}^+$ ,  $\text{Li}^{2+}$ , are known as Hydrogen like atom ?  
(ii) What are the main postulates of quantum mechanics ?
  8. What is Hermite polynomials in quantum mechanics?
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