Roll No. : .....

Total No. of Questions : **11**] [Total No. of Printed Pages : **3**

BPF–2201

M.Sc. (Final) Examination, 2022

CHEMISTRY

Paper - IX (A)

(Group-C)

CH-507

(Recent Trends in Physical Chemistry)

*Time : **3** Hours*] [*Maximum Marks : **75***

Section–A **(Marks : 2 × 10 = 20)**

Note :– Answer all *ten* questions (Answer limit **50** words). Each question carries **2** marks.

Section–B **(Marks : 5 × 5 = 25)**

Note :– Answer all *five* questions. Each question has internal choice (Answer limit **200** words). Each question carries **5** marks.

Section–C **(Marks : 10 × 3 = 30)**

Note :– Answer any *three* questions out of five (Answer limit **500** words). Each question carries **10** marks.

Section–A

1. (i) Define the PMO and FMO.

   (ii) What is ionization potential and electron affinities ?

(iii) Define the significance of Entropy.

(iv) What is Hamoud's Postulate ?

(v) Define S_1 and S_R Scales.

(vi) What is Steric LFER ?

(vii) Define the Hard and Soft Acid.

(viii) Define the LTD Model.

(ix) What is Entropy ?

(x) Define the terms RDF, IBG and PY.

Section–B

2. Write short notes on the following :

(i) FMO theory

(ii) HMO method

Or

What is transition state theory ? Explain with example.

3. Write short notes on the following :

(i) Isotopic effect

(ii) Tunnelling effect

Or

Explain the linear free energy relationships.

4. Write short notes on the following :

(i) Nucleophilicity scale

(ii) Nucleofugacity

Or

Explain the acid base dissociation and given to acidity function.

5. Write short notes on the following :

   (i) Enthalpy and Entropy

   (ii) LTD Model

Or

Explain the theory of liquid partition function method.

6. Write short notes on the following :

   (i) Computation Technique of Monte Carlo

   (ii) Macedo litovitz hybrid model

Or

Explain the molecular distribution functions.

Section–C

7. What is PMO and FMO theory ? Explain with example.

8. Discuss the significance of entropy and Gibbs free energy.

9. Discuss the various types of steric strain and steric acceleration.

10. Explain the following :

    (i) Intermolecular forces

    (ii) Nucleophilic and electrophilic catalyst

11. Explain the relationship between pair distribution function and pair potential function.