

Roll No. :

Total No. of Questions : 11]

[Total No. of Printed Pages : 3

BFMS-425

M.Sc. (Final) Examination, 2023

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.

BRI-545

(1)

BFMS-425 P.T.O.

Section–A

1. (i) Define Gibb's energy with example.
- (ii) What is primary kinetic isotope effect ?
- (iii) Define Hard and Soft acids and bases.
- (iv) What is thermodynamics measure of Solvation ?
- (v) Define cryptands with example.
- (vi) Define Hydrogen bond with examples.
- (vii) Write a short note on Critical Constant.
- (viii) Write the IBG equation.
- (ix) Define Monte Carlo method.
- (x) What is Cluster Expansion ?

Section–B

2. Write short notes on the following :
 - (a) Mo energy levels
 - (b) Curve-crossing model

Or

Explain Hamond's postulate.

3. Write short notes on the following :
 - (a) Nucleophilic and Electrophilic catalysis
 - (b) Ambivalent electrophiles with examples.

Or

Explain various types of steric strain and their effects on reactivity.

4. Explain supermolecular reactivity and catalysis with suitable examples.

Or

Explain Curtin-Hammett principle.

5. Write a short note on Internal pressure and its significance in liquids.

Or

Write a short note on different potential functions for liquids.

6. Explain the super cooled and ionic liquids with suitable examples.

Or

Explain the pair distribution function.

Section–C

7. (i) What is steric LFER ?

(ii) Write a short note on non-valent binding and micellar catalysis.

8. Write short notes on the following :

(a) Tunnelling effect

(b) Taft model

9. Explain reactivity, specificity and periselectivity in pericyclic reactions.

10. Explain how can you use neutron and X-ray scattering spectroscopy techniques for structural studies of liquid cerramics.

11. Write short notes on the following :

(i) Configurational entropy model

(ii) Non-arrehnius behaviour of transport properties