

Roll No. :

Total No. of Questions : 11]

[Total No. of Printed Pages : 3

CHEMSEM-103

M.Sc. (Ist Semester) Examination Dec., 2022

CHEMISTRY

Paper - CC-3

(Physical Chemistry-I)

Time : 3 Hours]

[Maximum Marks : 40

Section-A

(Marks : 1 × 10 = 10)

Note :- Answer all *ten* questions (Answer limit **50** words). Each question carries 1 mark.

Section-B

(Marks : 3 × 5 = 15)

Note :- Answer all *five* questions. Each question has internal choice (Answer limit **200** words). Each question carries 3 marks.

Section-C

(Marks : 5 × 3 = 15)

Note :- Answer any *three* questions out of five (Answer limit **500** words). Each question carries 5 marks.

Section-A

- (i) Write Schrödinger wave equation for the hydrogen atom.
- (ii) What is the energy of particle in a box ?

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CHEMSEM-103 P.T.O.

- (iii) What is Fugacity ?
- (iv) Define third law of Thermodynamics.
- (v) Write Arrhenius Equation.
- (vi) Give the example of unimolecular reaction.
- (vii) What is homogeneous catalysis ?
- (viii) Give the example of oscillating reaction.
- (ix) Write Kelvin Equation.
- (x) Define surface active agents.

Section-B

2. Discuss perturbation theory for the helium atom.

Or

Write short note on harmonic oscillator.

3. Define activity and activity coefficient.

Or

Write short note on phase rule.

4. Explain *two* methods of determining rate laws.

Or

Discuss the primary and secondary salt effect.

5. Discuss the kinetics of enzyme reactions.

Or

Write short note on Lindemann-Hinshelwood theory of unimolecular reaction.

6. Write short note on microemulsion and reverse micelles.

Or

Discuss the factors affecting the CMC of surfactants.

Section–C

7. Derive Schrödinger equation.
8. Explain partial molar free energy and partial molar volume.
9. Discuss in detail Collision theory of reaction rate.
10. Explain *two* methods for the study of fast reactions.
11. Derive BET equation.