PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2025
(Sixth Semester)

Branch – **CHEMISTRY**

PHYSICAL CHEMISTRY – II

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1. Of which of the following factors, the rate of the reaction depends on
(i) Molecular mass of the reactant (ii)Atomic mass of the reactant
(iii)Equivalent weight of the reactant (iv) Active mass of the reactant

2. In photochemical reaction, the range of absorbed wavelength is
(i) 0-100 nm (ii) 200-800 nm
(iii) 1000-1500 nm (iv) 400-4000 cm^{-1}

3. What is the dipole moment of a molecule?
(i) A measure of its polarity (ii) A measure of its molecular weight
(iii) A measure of its reactivity (iv) A measure of its solubility

4. Gibb's phase rule is
(i) F = C – P + 2 (ii) F = C + P + 2
(iii) F= C – P - 2 (iv) F = C-P + 3

5. What is the physical interpretation of the wave function (ψ^2) ?
(i) The probability of finding a particle at a given point in space
(ii) The energy of a particle
(iii) The momentum of a particle
(iv) The position of a particle.

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6. a) Differentiate between Order and Molecularity of the reaction.
OR
b) How the order of the reaction is determined by differential method?

7. a) Explain the Collision theory of bimolecular reaction.
OR
b) Write note on: (i) Fluorescence (ii) Phosphorescence

8. a) List out the applications of dipole moment.
OR
b) Compare paramagnetic and diamagnetic substances.

9. a) Derive Gibbs phase rule equation.
OR
b) Explain Phase diagram of Water system.

10. a) Interpret the concept of symmetry element and symmetry operation.
OR
b) Discuss the Eigen value and Eigen function.

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11. a) Derive rate constant of the first order reaction.

OR

b) Describe the kinetics of H_2 - Br_2 chain reactions.

12. a) Explain the theory of Absolute Reaction Rate (ARRT).

OR

b) Illustrate the laws of Photochemistry.

13. a) Explain any one method of determining dipole moment.

OR

b) How magnetic susceptibility is determined by Gouy's method?

14. a) Sketch and explain the phase diagram of Pb-Ag system.

OR

b) Illustrate the phase diagram of Sulphur system.

15. a) Construct the group multiplication table for C_{2v} point group.

OR

b) Derive Hamiltonian operator.

Z-Z-Z END