

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION MAY 2024
(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 The unit of rate constant for a zero-order reaction is
(i) litre/sec (ii) litre/mole/sec
(iii) mole/litre/sec (iv) sec^{-1}
- 2 Collision theory is satisfactory for _____ reaction
(i) first order (ii) zero order
(iii) bimolecular (iv) third order
- 3 Which of the following molecules will show dipole moment?
(i) Chloroform (ii) Methane
(iii) Carbon tetrachloride (iv) Carbon dioxide
- 4 The word eutectic means _____
(i) easy boiling (ii) easy cooling
(iii) easy vaporising (iv) easy melting
- 5 Choose the molecule that belongs to C_{2v} point group
(i) CO_2 (ii) BF_3
(iii) CH_2Cl_2 (iv) PCl_3

SECTION - B (15 Marks)

Answer ALL Questions
ALL Questions Carry EQUAL Marks (5 x 3 = 15)

- 6 a Explain the pseudo unimolecular reactions with an example.
OR
b State the consecutive and parallel reactions.
- 7 a Narrate the failure of collision theory.
OR
b Describe the chemiluminescence with examples.
- 8 a Show the Clausius-Mosotti equation and Debye equation.
OR
b Explain the diamagnetic property with examples.
- 9 a Sketch the phase diagram of the following systems, i) Water ii) Sulphur.
OR
b Explain the definitions of components and degrees of freedom.
- 10 a Construct the group multiplication table for C_{2v} point groups.
OR
b Discuss the derivation of Hamiltonian Operator.

Cont...

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

- 11 a Distinguish between the order and molecularity of a reaction.
OR
b Discuss the methods of determination of order of a reaction by graphical methods.
- 12 a Derive the Arrhenius equation.
OR
b Compare the fluorescence and phosphorescence.
- 13 a Summarize the applications of dipole moment.
OR
b Examine the measurement of magnetic susceptibility by Gouy's method.
- 14 a Derive the Gibbs phase rule equation.
OR
b Draw and discuss the phase diagram of simple eutectic system with an example.
- 15 a Outline the properties of groups.
OR
b Discuss the addition, subtraction and product of operators with examples.

Z-Z-Z

END