

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2024
(First Semester)

Branch - **CHEMISTRY**
GENERAL CHEMISTRY – I

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	What types of wave functions must be antisymmetric with respect to the interchange of two any electrons? a) Spatial b) Spatial and spin c) Spin d) Neither spatial nor spin	K1	CO1
	2	The highest ionization energy is exhibited by a) halogens b) alkaline earth metals c) transition metals d) noble gases	K2	CO1
2	3	According to Fajans' rules, covalent bond formation is favoured when there is a a) large cation and a small anion b) large cation and a large anion c) small cation and a small anion d) small cation and a large anion	K1	CO2
	4	The shape of SF ₆ will be a) Triangular pyramid b) Planar c) Octahedral d) Tetrahedral	K2	CO2
3	5	The order of the strength of covalent bond formed by overlapping of atomic orbitals is a) s-s > s-p > p-p b) s-s > p-p > s-p c) s-p > s-s > p-p d) p-p > s-p > s-s	K1	CO3
	6	During the formation of a molecular orbital from atomic orbitals, the electron density is a) minimum in the nodal plane b) maximum in the nodal plane c) zero in the nodal plane d) zero on the surface of the lobe	K2	CO3
4	7	The product PV for a gas has the same unit as a) Force b) temperature c) pressure d) energy	K1	CO4
	8	In collision, the mean free path of a gas molecule is _____ proportional to _____. a) inversely, P b) inversely, T c) directly, d d) directly, P	K2	CO4
5	9	What type of hybridization occurs in ethylene? a) sp b) sp ³ c) sp ² d) sp ³ d	K1	CO5
	10	The correct statement about the electromeric effect is a) It involves permanent polarization b) It operates through sigma bonds c) It is a strong effect since the loose pi electrons shift completely d) None of these is correct.	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the Heisenberg's uncertainty principle.	K2	CO1
		(OR)		
	11.b.	Analyze the trends of atomic radii and Ionization energy in a period and group.		
2	12.a.	Outline the general characteristics of ionic bond.	K3	CO2
		(OR)		
	12.b.	Utilize the term polarizability for Fajan's rule with example.		
3	13.a.	Examine the basis of VB approach.	K4	CO3
		(OR)		
	13.b.	Compare VB and MO theory.		
4	14.a.	List the basic postulates of the kinetic theory of gases.	K4	CO4
		(OR)		
	14.b.	Inspect about collision diameter and collision frequency.		
5	15.a.	Construct Hybridization and geometry of methane.	K3	CO5
		(OR)		
	15.b.	Apply the Inductive effect to explain acidic strength of carboxylic acid and carbocation stability.		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Inference the electronegativity by Pauling and Mulliken scales.	K4	CO1
2	17	Explore the Postulates of VSEPR theory and geometry of H ₂ O, BF ₃ and PCl ₅ .	K4	CO2
3	18	Dissect the MO diagram of He ₂ and CO.	K4	CO3
4	19	Examine the Maxwell's distribution of molecular velocities.	K4	CO4
5	20	List out the types of reactions with example in detail.	K4	CO5

Z-Z-Z

END