

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**BSc DEGREE EXAMINATION MAY 2026
(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	Which experiment verified the wave nature of electrons? (a) Photoelectric effect (b) Black body radiation (c) Davisson–Germer experiment (d) Rutherford scattering	K1	CO1
	2	Hund's rule explains: (a) Filling of orbitals singly with parallel spins (b) Order of orbital energy (c) Screening effect (d) Ionization energy trends	K2	CO1
2	3	The reason for high boiling point of water compared to H ₂ S is: (a) Lattice energy (b) Ionic bond (c) Hydrogen bonding (d) van der Waals forces	K1	CO2
	4	Shape of XeF ₄ molecule is: (a) Tetrahedral (b) Trigonal bipyramidal (c) Square planar (d) Octahedral	K2	CO2
3	5	The paramagnetism of O ₂ is explained by: (a) VBT (b) MOT (c) Radius ratio rule (d) Hybridization	K1	CO3
	6	Bond order of He ₂ is: (a) 0 (b) 0.5 (c) 1 (d) 2	K2	CO3
4	7	Which of the following is constant for an ideal gas under Charles's law? (a) Pressure (b) Volume (c) Number of molecules (d) Both a and c	K1	CO4
	8	The effect of pressure on the viscosity of gases (at low pressure) is: (a) Viscosity increases (b) Viscosity decreases (c) Viscosity remains almost constant (d) Viscosity becomes zero	K2	CO4
5	9	Hindrance to a reaction due to bulky groups is called: (a) Inductive effect (b) Hyperconjugation (c) Steric effect (d) Resonance	K1	CO5
	10	A neutral divalent carbon species is called: (a) Carbocation (b) Carbene (c) Aryne (d) Nitrene	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.	Describe Davison and Germer Experiment.	K1	CO1
	(OR)			
	11.b.	Write a note on Heisenberg Uncertainty Principle and Aufbau principle.		
2	12.a.	Discuss the postulates of VSEPR theory and explain the shape of H ₂ O molecules.	K2	CO2
	(OR)			
	12.b.	Explain Fajan's rules.		
3	13.a.	Investigate the Bond order of N ₂ molecule using MO diagram.	K4	CO3
	(OR)			
	13.b.	Compare VBT and MOT.		
4	14.a.	Explain the effect of temperature on distribution of molecular velocities.	K4	CO4
	(OR)			
	14.b.	Examine the equipartition principle of energy.		
5	15.a.	Analyze the formation, structure and stability of carbanion.	K4	CO5
	(OR)			
	15.b.	Compare nucleophiles and electrophiles.		

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	Describe in detail how electronegativity was calculated using Pauling and Mullikan scales.	K1	CO1
2	17	Enumerate how lattice energy was calculated according to Born-Haber cycle with suitable example.	K1	CO2
3	18	Construct a MO diagram for O ₂ and O ₂ ⁻ and calculate bond order.	K3	CO3
4	19	Analyze the following (a) collision frequency (b) collision diameter (c) mean free path of molecules.		CO4
5	20	Investigate the types of reactions with suitable examples.		CO5