## Question Bank: GE-II, IV

1. Answer all the questions [1×8=8]

i. Why are some elements chemically inert?
ii. What is the charge and mass of α particle?
iii. What are valence electrons?
iv. Find the number of neutrons in $^{27}x_{13}$?
v. The number of radial nodes for 3P orbitals is?
vi. Which rule is responsible to rule out the existence of definite paths or trajectories of electrons?
vii. Name an atom in which the nucleus of that atom does not contain any neutrons?
viii. Which models describes that there is no change in the energy of electron as long as they keep revolving in the same energy level and atoms remain stable?

2. Answer any **Eight** the questions [1.5×8=12]

I. $Mg^{2+}$ is isoelectronic with?
II. During a chemical reaction, atomic number?
III. Can a non-polar molecule have polar covalent bonds?
IV. Why an ionic bond is formed between two elements having large difference in their electro-negativity?
V. Out of $\sigma$ and π bond which bond is stronger and why?
VI. Explain why dipole moment of hydrogen halides decreases from HF to HI?
VII. Out of P-orbital and SP-hybrid orbital which has greater directional character and why?
VIII. Define dipole moment?
IX. How do covalent bond form due to orbital overlapping?
X. Define bond order?
XI. Define electrovalent bond?
XII. Why are bonding molecular orbitals more stable than antibonding molecular orbitals?

3. Answer any **Eight** the questions [2×8=16]

i. Write the significance of octet rule?
ii. Write the Lewis structure for CO molecule?

iii. Why $NH_3$ has higher dipole moment than $NF_3$ though both are pyramidal?

iv. Mention the factor that influence the formation of an ionic bond.

v. Explain why $PCI_5$ is trigonal bipyramidal where as $IF_5$ is square pyramidal?

vi. What is Hybridisation?

vii. What is Formal charge?

viii. Define Lattice Energy?

ix. Statement of Born-Lande equation explain?

x. What is Polarising power?

4. Answer any **Four** questions [4×6=24]

i. Explain Bohr's theory and its limitations?

ii. Explain Heisenberg Uncertainty principle?

iii. What is Quantum mechanics? state time independent Schrodinger equation?

iv. Explain Lattice energy and Solvation energy?

v. Statement of Born-Lande equation for calculation of lattice energy?

vi. Explain Born-Haber cycle and its applications?

vii. Explain Hybridisation with suitable examples of linear, trigonal planar and square planar?

viii. Discuss the significance/applications of dipole moment. Represent diagrammatically the bond moment and the resultant dipole moment in $CO_2$ and $NF_3$.