



Paper Code : CHEDSC 14L

B.Sc. IV Semester Degree Examination (NEP), October/November 2023

Subject : CHEMISTRY (Paper – I)

Paper : Inorganic and Physical Chemistry

Time : 2½ Hours

Max. Marks : 60

Instruction : Answer *all* the Sections.

SECTION – A

Answer **any five** of the following :

(5×2=10)

1. a) What are ionic compounds of type AX_2 ? Give example.
b) State isoelectronic principle.
c) Write any two differences between BMO's and ABMO's.
d) What is Joule-Thomson effect ?
e) State first law of thermodynamics and write its mathematical form.
f) What is homogeneous catalysis ? Give an example.
g) What is molar conductance ? Write its SI unit.

SECTION – B

Answer **any four** of the following :

(4×5=20)

2. Derive Born-Lande equation.
3. Write any four postulates of VSEPR theory.
4. Explain sp^3 -hybridization with a suitable example.
5. Write Gibbs-Helmholtz equation and mention the terms.
6. Explain intermediate compound formation theory of catalysis.
7. State Kohlrausch's law of independent migration of ions.

P.T.O.



SECTION – C

Answer **any three** of the following :

(3×10=30)

8. a) What is radius ratio ? Calculate the limiting radius ratio of an ionic solid when co-ordination number is 3.
b) Explain the shape of PCl_5 on the basis of VSEPR theory.
 9. a) Draw the MO diagram of O_2 molecule. Calculate its bond order and predict magnetic property.
b) State and explain Bent's rule.
 10. a) Derive an expression for workdone during reversible isothermal expansion of an ideal gas.
b) State second law of thermodynamics in terms of entropy.
 11. a) Calculate the maximum work obtained when 2 moles of nitrogen were expanded isothermally and reversibly from 10 litres to 20 litres at 25°C . [Given $n = 2$ moles, $T = 298 \text{ K}$, $R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$].
b) Write a note on free electron theory of metals.
 12. a) Derive an expression for rate constant of second order reaction, when concentration of both reactants are same ($a = b$).
b) Explain the application of conductance measurements in the determination of
 - i) Ionic product of water
 - ii) Hydrolysis constants of salts.
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