

1 630258



DCCH401

Reg. No.

--	--	--	--	--	--	--	--

IV Semester B.Sc. Degree Examination, September - 2023

CHEMISTRY

Inorganic and Physical Chemistry - II

Paper : IV

(NEP - (CBCS Scheme) 2021-22 Onwards)



Time : 2½ Hours

Maximum Marks : 60

Instructions to Candidates:

1. The question paper has **three** parts. Answer **all** the parts.
2. Draw **diagrams** and write chemical equations wherever necessary.

PART - A

Answer any **FIVE** of the following questions. Each question carries 2 marks. (5×2=10)

1. What are ionic compounds of the type AX_2 ? Give an example.
2. What is Octet rule? Mention a compound which obeys the rule.
3. Which type of hybridization involved in SF_6 molecule and predict its geometry.
4. Give statement of II law of thermodynamics.
5. Write B.E.T equation and indicate the terms involved.
6. What is specific conductance? Write it's SI unit.

PART - B

Answer any **FOUR** of the following questions. Each question carries 5 marks.

(4×5=20)

7. a) Define radius ratio. What are the factors affecting radius ratio?
b) What is Bent's rule? (3+2)
8. a) Draw the molecular orbital diagram of Li_2 molecule. Calculate it's bond order and predict the magnetic property.
b) What are extrinsic and intrinsic semiconductors? (3+2)

[P.T.O.]



(2)

DCCH401

9. a) Derive the expression for workdone in Isothermal reversible expansion of an Ideal gas.
b) Define Gibb's free energy. (3+2)
10. a) Explain how the adsorption theory can be used to explain catalysis.
b) Explain catalytic poisoning. (3+2)
11. a) Explain the integral method of determination of order of a reaction.
b) Name the factors which affect the rate of a reaction. (3+2)
12. a) What are the limitations of Arrhenius theory?
b) What is electrophoretic effect? (3+2)

PART - C

Answer any **THREE** of the following questions. Each question carries **10** marks.

(3×10=30)

13. a) Calculate lattice energy of MgO. based on Born-Lande equation.
b) Write the postulates of valence bond theory.
c) What are the rules for linear combination of atomic orbitals? (4+4+2)
14. a) Explain the following general properties of metals in detail.
i) Conductivity
ii) Lustre
iii) Malleability
iv) Cohesive force.
b) Define heat capacity of a gas. Derive the relationship between C_p and C_v for an ideal gas.
c) Give two examples of state functions. (4+4+2)
15. a) Explain the statistical interpretation of entropy.
b) Explain the conductometric titration of strong acid with strong base.
c) What is enzyme catalysis? Give an example. (4+4+2)
16. a) Derive an expression for the velocity constant of a second order reaction; $a=b$.
b) State and explain Freundlich adsorption isotherm. What are its limitations?
c) Define temperature coefficient of a reaction. (4+4+2)
17. a) What are abnormal transport number? Explain the causes for abnormal transport number.
b) Explain the determination of transport number of an ion by moving boundary method.
c) Define molar conductance of an electrolyte. (4+4+2)