

(3 Hours)

Total Marks: 80

- N.B.:** 1) All questions are compulsory
 2) Answer all sub questions together
 3) Figures to right indicate full marks

Q.1 (a) Explain the terms (Any 5)

- | | |
|----------------------------|----------------------|
| i) Catalyst | ii) Quantum number |
| iii) Physiological buffers | iv) Expectorants |
| v) Rate constant | vi) Chelating agents |

5

b) Answer the following (Any 5)

- Draw Lewis structure for PCl_5 and state hybridization of central atom
- Give one example sclerosing agent and its use
- Define: Systemic antacid. Mention any two disadvantages
- Explain role of copper as essential and trace element
- Draw an energy profile diagram for two step reaction and indicate an intermediate and a rate determining step
- Classify: calcium gluconate, magnesium trisilicate, sodium chloride, sodium acetate

10

b) Match the following

5

	Column A	Column B
i)	EDTA	Calamine
ii)	Cr-51	Chelating agent
iii)	Aluminum chloride	Planar geometry
iv)	BF_3	Survival time for RBCs
v)	Zinc carbonate	Electrophilic catalyst

Q.2 a) ' Isotope effect is maximum for hydrogen ', Explain the statement and give applications for it

4

b) Answer the following (Any 2)

4

- Discuss protein precipitant as antimicrobial agents
 - When are the emetic agents required? Explain their mechanism of action briefly and give one example
 - Explain why talc is a protective topical agent?
- c) Add a note on applications of radioactive iodine preparations**
- d) Elaborate physiological role of sodium ion**

2

2

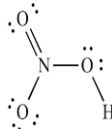
Q.3 a) i) Explain Electrophilic catalysis in brief

2

- Discuss how phase transfer catalysis takes place in the reaction mixture?

2

- b) i) Justify use of Dilute Hydrochloric acid for treatment 2
 ii) State significance and examples of combinations antacids 2
 c) Give ground state electronic configurations: Sodium, Sulphur 2
 d) Calculate the formal charge on nitrogen and double bonded oxygen 2



Q.4 a) Complete the following table on the basis of hybridization concept 4

Molecule	Hybridization state of the underlined atom	Bond angle
<u>Si</u> Cl ₄		
H ₂ <u>O</u>		
<u>B</u> F ₃		
<u>C</u> in Ethylene		

- b) Elaborate on mechanism of actions for antimicrobials and uses of hydrogen peroxide 4
 c) State and explain reactivity-selectivity principle 2
 d) State an example of a reaction giving kinetically controlled product and thermodynamically controlled product and justify 2

Q.5a) State true or false 4

- i) d_{xy}, d_{yz} and d_{xz} orbitals have pi symmetry
 ii) Electron affinity is same as electronegativity for any element
 iii) Dipole moment for NH₃ is less than NF₃
 iv) Bond angle for CH₄ is 90° by hybridization theory

- b) What is a general base? Derive an expression for general base catalysis 4
 c) Discuss use of sodium nitrite and sodium thiosulphate in cyanide poisoning 2
 d) Write a note on electrolytes used in replacement therapy 2

Q.6 Answer the following (Any 6) 12

- i) State rate law and molecularity for the reaction : H₂ + Cl₂ → 2HCl
 ii) Give uses of radioactive Co-57 and Co-60
 iii) How Hammond's postulate is related to reactivity-selectivity principle ?
 iv) What is the weight of NaCl needed to prepare a liter of solution containing 9 mEq Na⁺/l
 v) Explain the role of iron as essential and trace elements
 vi) Write a note on biological effects of radiations
 vii) Give any two examples of protective and adsorbents and explain their use