

(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  $\text{PCl}_5$  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)	$\text{BF}_3$	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

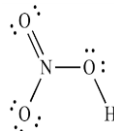
- Q.3 a) i)** Explain Electrophilic catalysis in brief

2

- ii) 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 <sub>4</sub>		
H <sub>2</sub> <u>O</u>		
<u>B</u> F <sub>3</sub>		
<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) dxy, dyz and dzx orbitals have pi symmetry
- ii) Electron affinity is same as electronegativity for any element
- iii) Dipole moment for NH<sub>3</sub> is less than NF<sub>3</sub>
- iv) Bond angle for CH<sub>4</sub> 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 : H<sub>2</sub> + Cl<sub>2</sub> → 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<sup>+</sup>/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