



**I. Choose The Correct Answer:**

**[8 x 1 = 8]**

- For a first order reaction, the rate constant is  $6.909 \text{ min}^{-1}$ . the time taken for 75% conversion in minutes is?  
(a)  $\left(\frac{3}{2}\right) \log 2$                       (b)  $\left(\frac{2}{3}\right) \log 2$                       (c)  $\left(\frac{3}{2}\right) \log \left(\frac{3}{4}\right)$                       (d)  $\left(\frac{2}{3}\right) \log \left(\frac{4}{3}\right)$
- If the initial concentration of the reactant is doubled, the time for half reaction is also doubled. Then the order of the reaction is?  
(a) Zero                      (b) One                      (c) Fraction                      (d) None
- Conjugate base for Bronsted acids  $\text{H}_2\text{O}$  and  $\text{HF}$  are  
(a)  $\text{OH}^-$  and  $\text{H}_2\text{FH}^+$ , respectively                      (b)  $\text{H}_3\text{O}^+$  and  $\text{F}^-$ , respectively  
(c)  $\text{OH}^-$  and  $\text{F}^-$ , respectively                      (d)  $\text{H}_3\text{O}^+$  and  $\text{H}_2\text{F}^+$ , respectively
- Which of the following fluoro compounds is most likely to behave as a Lewis base?  
(a)  $\text{BF}_3$                       (b)  $\text{PF}_3$                       (c)  $\text{CF}_4$                       (d)  $\text{SiF}_4$
- The number of electrons that have a total charge of 9650 coulombs is  
(a)  $6.22 \times 10^{23}$                       (b)  $6.022 \times 10^{24}$                       (c)  $6.022 \times 10^{22}$                       (d)  $6.022 \times 10^{-34}$
- How many faradays of electricity are required for the following reaction to occur  $\text{MnO}_4^- \rightarrow \text{Mn}^{2+}$   
(a) 5F                      (b) 3F                      (c) 1F                      (d) 7F
- Which one of the following rotates the plane polarized light towards left?  
(a) D(+) Glucose                      (b) L(+) Glucose                      (c) D(-) Fructose                      (d) D(+) Galactose
- In a protein, various amino acids linked together by?  
(a) Peptide bond                      (b) Dative bond                      (c)  $\alpha$  - Glycosidic bond                      (d)  $\beta$  - Glycosidic bond

**II. Answer any 5 of the following questions:**

**[5 x 2 = 10]**

9. Define rate law and rate constant.
10. Define average rate.
11. Give two examples for zero order Reaction
12. What are Lewis acids and bases? Give two examples for each.
13. Define pH
14. Define Faraday's first law.

**III. Answer any 4 of the following questions:**

**[4 x 3 = 12]**

15. How do concentrations of the reactant influence the rate of reaction?
16. The rate constant for a first order reaction is  $1.54 \times 10^{-3} \text{ s}^{-1}$ . Calculate its half life time.
17. Discuss the Lowry – Bronsted concept of acids and bases.
18. Define Molar Conductivity.
19. Write a short note on peptide bond.

**IV. Answer any 4 of the following questions:**

**[4 x 5 = 20]**

20. Derive integrated rate law for a zero order reaction  $A \rightarrow \text{product}$ .
21. What is an elementary reaction? Give the differences between order and molecularity of a reaction.
22. Derive an expression for Ostwald's dilution law
23. Derive an expression for Nernst equation
24. Write the structure of  $\alpha$ -D (+) glucopyranose.