Reg. No ..... Name **24U444**

B. Sc. DEGREE END SEMESTER EXAMINATION - MARCH 2024

SEMESTER 4 - COMPLEMENTARY CHEMISTRY FOR PHYSICS

COURSE : **19U4CPCHE4.1 - ADVANCED PHYSICAL CHEMISTRY - II**

(For Regular - 2022 Admission and Improvement / Supplementary - 2021/2020/2019 Admissions)

Time : Three Hours Max. Marks: 60

PART A

Answer All (1 mark each)

1. What do you mean by concentration cell with and without transference?
2. How does light induce reaction?
3. Point out the use of H_2SO_4 in Permanganometric Titrations.
4. Which of the following molecule shows rotational spectrum? N_2 or HBr.
5. Define rate of a reaction.
6. Comment on the acidic / basic nature of Na_2CO_3 solution in water
7. What is the purpose of heating oxalic acid before the titration?
8. What is meant by fingerprint region in an IR spectrum?

(1 x 8 = 8)

PART B

Answer any 6 (2 marks each)

9. What is primary photochemical process? Give examples.
10. What is the effect of dilution on specific conductance?
11. Determine the oxidation state of Cr in $K_2Cr_2O_7$ and K_2CrO_4.
12. Give the Michaelis-Menten equation and explain the terms.
13. Explain red shift with a suitable example.
14. Give the electrode reactions of hydrogen oxygen fuel cell.
15. Distinguish between chemical equivalent and electrochemical equivalent.
16. Calculate the standard EMF of the cell. Given Cu $E^o(Zn2+|Zn) = -0.76V$, $E^o (Ag+|Ag)=0.80V$

(2 x 6 = 12)

PART C

Answer any 4 (5 marks each)

17. Discuss the determination of pH using glass electrode?
18. Can you do the conductometric titration of acetic acid against ammonium hydroxide? Describe.
19. What are the differences between fluorescence and phosphorescence?
20. Explain the terms chromophores and auxochromes with suitable examples.
21. Explain homogenous catalysis and heterogenous catalysis with suitable examples.
22. Describe briefly the rules with examples for assigning oxidation state for a polyatomic molecule.

(5 x 4 = 20)

PART D
Answer any 2 (10 marks each)

23. Describe the determination pH using a) quinhydrone electrode b) Glass electrode. Mention its advantages

24. a) Illustrate with examples the determination of vibrational degrees of freedom for linear and non-linear molecules.
    b) Write down the applications of Infra red spectroscopy.

25. Discuss different methods to determine the order of a reaction.

26. What is Kohlrausch law? Give its applications.

(10 x 2 = 20)