QP CODE: 24800573

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Reg No : .....

Name : .....

INTEGRATED MSC DEGREE EXAMINATION, DECEMBER 2023

Sixth Semester

INTEGRATED MSC BASIC SCIENCE-CHEMISTRY

CORE - ICH6CR04 - PHYSICAL CHEMISTRY - IV

2020 Admission Onwards

424F40EE

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Silver is monovalent and has atomic masss of 108. Copper is divalent has an atomic mass of 63.6 g. The same electric current is passed for the same length of time through a silver coulometer and a copper coulometer. If 27.0 g of silver is deposited , then calculate the corresponding amount of copper deposied.
2. List out the applications of Conductance Measurements
3. Describe Daniell Cell also give its symbolic representation.
4. Give relation connecting Gibb's Helmohltz equation and EMF of a cell
5. Define Electrode concentration cell
6. Illustare Quinhydrone electrode diagram for the determintion of pH
7. Briefly explain Precipitation titration using Potentiometry
8. Explain and give examples of systems with both upper and lower CST
9. Define Colligatve properties
10. Calculate the molal freezing point depression constant of water. The molar heat of fusion of ice is at 0^0C is 6024.6 J

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Illustrate how Kohlrausch's law is used for the calculation of molar ionic Conductivity at infinite dilution for weak electrolytes.

12. Describe ionic mobilty and Discuss how it is related with Molar Conductivity.

13. Explain the reaction takeplace inside the Calomel Elctrode also expalin its advantages over other reference electrodes

14. Calculate the EMF of the following electrochemical cell at 298 K. $Cu/Cu^{2+}(0.1M)$ // H^{+} (0.01M) / H_2 (g, 1atm), Pt

15. Derive an expression for liquid junction potential.

16. Describe the Deviation of Raoult's law in-detail

17. Explain Reverse osmosis. Discuss the various types of semipermeable membranes used for the process. and also explain what is the potential of this process for making sea water fit for drinking.

18. Write a note on abnormal molecular masses

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Discuss the determination of Transport Number using:
    a) Hittorf's method b) Moving boundary method

20. Discuss Debye - Huckel theory of Strong Electrolytes.

21. a) Explain Eectrochemicl Theory of Rusting with Schematic Diagram. b) Describe the different methods used for corrosion monitoring in electrochemistry.

22. Discuss the thermodynamics of Mixing of Ideal Solutions in detail

(2×5=10 weightage)