20U613

Name: ....

Reg.No: ....

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2023

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19U CHE6 B11 - PHYSICAL CHEMISTRY - III

(Chemistry - Core Course)

(2019 Admission onwards)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

Answer *all* questions. Each question carries 2 marks.

1. State ostwald's dilution law.

2. State electrophoretic effect.

3. The limiting molar conductivity of acetic acid at 293 K is 360 S cm² mol⁻¹. The molar conductivity of a particular acetic acid solution is found to be 130.7 S cm² mol⁻¹ at 293 K. Find the percentage of dissociation of acetic acid at this dilution.

4. Sketch the conductometric titration curve for the CH_3COOH x NaOH titration.

5. Why is KCl commonly used in a salt bridge?

6. What are ion-ion electrodes? Give an example.

7. What are colligative properties? Give two examples

8. State and explain Charles-van't Hoff law for solutions.

9. What is meant by buffer action?

10. What is the coordination of Cl^- and Na^+ in NaCl?

11. What are Weiss indices?

12. Distinguish between solidification point and transparancy temperature in the case of liquid crystals.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer *all* questions. Each question carries 5 marks.

13. State and explain Faraday's first law of electrolysis.

14. Briefly explain the moving boundary method for the determination of transport number.

15. Write a short note on corrosion of metals and the different types of corrosion.

16. Define a solution. What are the different types of solutions?

17. Derive the expression for hydrolysis constant of a salt of strong base and weak acid.

18. The first order diffraction of a beam of X-rays of wavelength 15.4 A^0 from the (100) planes of a crystal occurs at an angle of 11°29'. Calculate the distance between the (100) planes.

19. Explain extrinsic semiconductivity based on band theory.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

20. What is corrosion? Discuss the electrochemical theory of corrosion. Briefly explain how corrosion can be prevented.

21. Name an AB, type ionic crystal and discuss its structure.

(1 × 10 = 10 Marks)

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