C 80161 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER B.A./B.Sc. DEGREE EXAMINATION, MARCH 2020

(CUCBCSS—UG)

Chemistry

CHE 6B 11—PHYSICAL CHEMISTRY–III

Time : Three Hours Maximum : 80 Marks

Section A

Answer **all** *questions.*

Each question carries 1 *mark.*

1. How does the value of Henry's constant will change when the pressure of a gas is increased ?
2. Give any one application of electrolysis.
3. Name the most symmetric crystal system.
4. State Ostwald's dilution law.
5. Calculate the pH of 0.00001M solution.
6. Define electrochemical series.
7. Write the Conjugate base of NH_3.
8. Give mathematical expression for Raoult's law.
9. List one advantage of fuel cell.
10. Why is it necessary to use a salt bridge in a Galvanic cell ?

(10 × 1 = 10 marks)

Section B

Answer any **ten** *questions.*

Each question carries 2 *marks.*

11. What is Henderson equation ?
12. The solubility of AgCl is 1.05×10^{-5} mol/L. Calculate the solubility product.
13. What is Calomel electrode ?
14. What are liquid crystals ? How they are classified ?
15. What is reverse osmosis ?
16. What is common ion effect ?
17. Define cryoscopic constant and ebullioscopic constant.

Turn over

18. What do you meant by Van't Hoff Factor ?
19. What are buffer solutions ?
20. Write down the crystal angles of a unit cell of tetragonal, and monoclinic crystal systems.
21. Give the Debye-Huckel-Onsager equation and show its experimental verification.
22. Calculate the ionic strength of solution containing 0.2 M $CaCl_2$ and 0.05M NaCl.

(10 × 2 = 20 marks)

Section C

Answer any **five** *questions.*
Each question carries **6** *marks.*

23. Differentiate between ideal and non-ideal solutions.
24. Write a short note on concentration cells without transference.
25. Explain Kohlrausch's law. What are its applications ?
26. Give an account of modern concepts of acids and bases.
27. Explain Wein effect and Debye -Falkennhagen effect.
28. Derive Bragg's equation.
29. What is quinhydrone electrode ? What is its application and limitations ?
30. Discuss the structure of NaCl.

(5 × 6 = 30 marks)

Section D

Answer any **two** *questions.*
Each question carries **10** *marks.*

31. Explain Stoichiometric and Non stoichiometric defects.
32. Explain the terms (i) Liquid junction potential (ii) Fuel Cell (iii) glass electrode.
33. Discuss potentiometric and conductometric titrations.
34. (a) Define Hydrolysis constant and Degree of hydrolysis of a salt.
    (b) Illustrate the relationship between hydrolysis constant (K_h) with K_w of (i) salt of strong acid and weak base (ii) salt of weak acid and weak base.

(2 × 10 = 20 marks)