D 140105 **(Pages : 2)** **Name.....**

Reg. No.....

SIXTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2026

Chemistry/Polymer Chemistry

CHE 6B 11—PHYSICAL CHEMISTRY—III

(2020 Admission onwards)

Time : Two Hours Maximum : 60 Marks

Section A (Short Answers)

Answer questions up to 20 *marks.*
Each question carries 2 *marks.*

1. What is Wein effect ?
2. Calculate the liquid junction potential at 25°C between two solutions of HCl having mean ionic activities 0.1 and 0.01 respectively. The transport number of H^+ ion in HCl is 0.83.
3. Differentiate electrode concentration cells and electrolyte concentration cells ?
4. Write down Debye -Huckel-Onsager equation and explain the terms.
5. State Raoult's Law.
6. What is common ion effect ?
7. Calculate the Miller index of a plane with $x = 2$, $y = 3$ and $z = 3$?
8. What is meant by Optical Exaltation?
9. Determine the spacing between the (123) planes of an orthorhombic unit cell with parametres a = 50 pm, b = 100 pm, and c = 150 pm.
10. Define Vant Hoff factor.
11. What is solubility product ?
12. What are the important applications of liquid crystals ?

(Ceiling of marks : 20)

Turn over

Section B (Paragraph)

Answer questions up to 30 *marks.*
Each question carries 5 *marks.*

13. State Henry's Law.

14. Discuss any one application of EMF measurements.

15. What are fuel cells ? Describe $H_2 - O_2$ fuel cell and its cell reactions.

16. Derive the relation between osmotic pressure and lowering of vapour pressure.

17. Discuss the structure of NaCl and CsCl.

18. Write a short note on nonstoichiometric defects in crystals.

19. What are Buffers ? How is its classified ? Discuss its action.

(Ceiling of marks: 30)

Section C (Essay)

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

20. a) Derive Bragg's equation. (5 marks)

    b) What are liquid crystals ? How is it classified ? Explain. (5 marks)

21. What are conductometric titrations ? Discuss the conductometric titrations of strong acid- strong base, weak acid-strong base, strong acid-weak base and weak acid-weak base.

[1 × 10 = 10 marks]