K23U 0475

Reg. No. : ....

Name : ....

VI Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/ Improvement) Examination, April 2023
(2019 and 2020 Admissions)
CORE COURSE IN CHEMISTRY/POLYMER CHEMISTRY
6B15 CHE/PCH : Physical Chemistry – III

Time : 3 Hours

Max. Marks : 40

SECTION – A

(Very short answer type. **Each** carries **1** mark. Answer **all 4** questions.)

1. Define molar conductance.

2. What is meant by buffer index ?

3. What is liquid junction potential ?

4. Define the term quantum yield.

$(4 \times 1 = 4)$

SECTION – B

(Answer **any 7** questions. **Each** question carries **2 marks.**)

5. Calculate the ionic strength of a solution containing 0.2 M NaCl and 0.2 M $BaCl_2$.

6. Define wein effect and debye-falkenhagen effect.

7. Write any two applications of buffer.

8. Calculate the ionization constant of NH_4OH at 25°C if it is 1% ionized in 0.18 M solution at 25°C.

9. What is Weston Cadmium cell ?

10. Write Ilkovic equation and explain the terms involved.

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K23U 0475

11. Distinguish between order and molecularity.

12. Explain pseudo first order reaction with an example.

13. The rate constant for a first order reaction is 1.54×10^{-3} s^{-1}. Calculate its half life time.

14. Explain Beer-Lambert law.

$(7 \times 2 = 14)$

SECTION – C

(Answer **any 4** questions. **Each** question carries **3 marks.**)

15. Discuss the conductometric titration curves obtained in the titration of (a) Strong acid with a strong base and (b) Strong acid with a weak base.

16. What is meant by buffer solution ? Derive Henderson's equation for the pH of an acidic buffer.

17. What are concentration cells ? How are they classified ?

18. Write a note on hydrogen-oxygen fuel cell.

19. Differentiate between homogeneous and heterogeneous catalysis with examples.

20. Write a note on colorimetry.

$(4 \times 3 = 12)$

SECTION – D

(Answer **any 2** questions. **Each** question carries **5 marks**).

21. Explain the Kohlrausch's law and its applications.

22. a) Discuss the construction and working of calomel electrode.

    b) The standard EMF of the Daniel cell involving the cell reaction.

      $Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$, is 1.10 volts. Calculate the equilibrium constant of the cell reaction at 25°C.

23. Describe briefly any 2 types of electrodes which can be used for determining pH of a solution. Discuss their merits and demerits.

24. Discuss the kinetics of unimolecular surface reactions.

$(2 \times 5 = 10)$

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