K24U 2721

Reg. No. : .....

Name : .....

V Semester B.Sc. Degree (C.B.C.S.S. – O.B.E. – Regular/ Supplementary/ Improvement) Examination, November 2024
(2019 to 2022 Admissions)
CORE COURSE IN CHEMISTRY/POLYMER CHEMISTRY
5B10CHE/PCH : Physical Chemistry – II

Time : 3 Hours Max. Marks : 40

SECTION – A

Answer **all** questions. **Each** question carries **1** mark. **(4×1=4)**

1. Define system and surroundings.
2. What is chemical potential ?
3. Give an example for homogenous equilibrium reaction.
4. Define gold number.

SECTION – B

Answer **any 7** questions. **Each** question carries **2** marks. **(7×2=14)**

5. Differentiate between intensive and extensive properties.
6. What is a path function ? Give an example.
7. What are the limitations of first law of thermodynamics ?
8. How chemical potential varies with temperature and pressure? Explain.
9. Predict the role of change in pressure in the following reaction : $H_{2(g)} + Cl_{2(g)} \rightleftharpoons 2HCl$.
10. What is phase rule ?
11. Explain the desilverisation process in the extraction of lead.
12. The slope of the line between solid and liquid states in the phase diagram of water is negative. Why ?
13. What are emulsifying agents ? Give an example.
14. State and explain Hardy-Schulze rule.

P.T.O.

SECTION – C

Answer **any 4** questions. **Each** question carries **3** marks. **(4×3=12)**

15. Differentiate between physisorption and chemisorption. Illustrate with examples.
16. Explain briefly the phase diagram of sulfur.
17. Derive the relation between K_p and K_x.
18. Write a note on Maxwell relations.
19. State and explain Hess's law. What are its applications ?
20. Explain Joule Thomson effect and its applications.

SECTION – D

Answer **any 2** questions. **Each** question carries **5** marks. **(2×5=10)**

21. Derive :
    i) Relationship between C_p and C_v.
    ii) Expression for work done during adiabatic expansion.
22. Discuss :
    i) Carnot cycle.
    ii) Gibbs- Helmholtz equation and its use to predict the spontaneity of a reaction.
23. Explain :
    i) Langmuir adsorption isotherm.
    ii) Freundlich adsorption isotherm.
24. Discuss :
    i) Nernst distribution law.
    ii) Application of phase rule to $FeCl_3$-water system.
