Reg. No. : ....

Name : ....

V Semester B.Sc. Degree (CBCSS-Reg./Sup./Imp.) Examination, November 2020
(2014 Admn. Onwards)
CORE COURSE IN CHEMISTRY
5B10 CHE : Physical Chemistry – II

Time : 3 Hours   Max. Marks : 40

SECTION – A

Answer **all** questions. **Each** question carries **1** mark.

1. What is chemical potential ?

2. State Nernst distribution Law.

3. Write the relation between Kp and Kc for the reaction, $N_2O_{4(g)} \rightleftharpoons 2NO_{2(g)}$.

4. What is Zeta potential ?   **(4×1=4)**

SECTION – B

Answer **any seven** questions. **Each** question carries **2** marks.

5. What are intensive and extensive properties ?

6. State and explain Zeroth law of thermodynamics.

7. Write and explain Kirchoff's equation.

8. What is Joule-Thomson effect ?

9. Calculate the free energy change occurs when 1 mole of an ideal gas expands isothermally and reversibly rom a volume of 100 dm^3 to 1000 dm^3 at 25°C.

10. Explain the term absolute entropy.

11. Explain Hardy-Schulze rules.

12. Explain deliquescence and efflorescence with examples.

13. Explain solvent extraction.

14. Write and explain the terms involved in BET equation. **(7×2=14)**

SECTION – C

Answer **any four** questions. **Each** question carries **3** marks.

15. Derive Gibb-Helmholtz equation.

16. Write and explain Maxwell's relations.

17. Derive the relation between Kp, Kc and Kx.

18. What are simple eutectic systems explain with an example ?

19. Derive the Phase rule.

20. Derive Langmuir adsorption isotherm. **(4×3=12)**

SECTION – D

Answer **any two** questions. **Each** question carries **5** marks.

21. Derive Clapeyron-Clausius equation. Explain application of this equation to solid-liquid and solid-vapour equilibrium.

22. Explain Joule-Thomson effect. Derive the expression for Joule-Thomson coefficient.

23. State and explain Le-Chetelier' principle. Discuss the effect of temperature, pressure and concentration of reactants on following equilibria,

    a) $N_2O_{4(g)} \rightleftharpoons 2NO_{2(g)}$, $\Delta H = + 59kJ$

    b) $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$, $\Delta H = - 92.4kJ$.

24. What are one component systems ? Explain Sulphur system with the help of phase diagram. **(2×5=10)**

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