



K23U 2336

Reg. No. :

Name :

V Semester B.Sc. Degree (C.B.C.S.S. – O.B.E. – Regular/Supplementary/
Improvement) Examination, November 2023
(2019-2021 Admissions)
CORE COURSE IN CHEMISTRY/POLYMER CHEMISTRY
5B10CHE/PCH : Physical Chemistry – II

Time : 3 Hours

Max. Marks : 40

Instruction : Answer the questions in **English** only.

SECTION – A

Answer all questions. Each carries 1 mark.

1. What is inversion temperature ?
2. Give Gibb's-Helmholtz equation.
3. What is the relationship between K_p and K_c ?
4. Give one example each for water in oil and oil in water emulsion. (4×1=4)

SECTION – B

Answer any 7 questions out of 10. Each carries 2 marks.

5. If enthalpy change of reaction for the process $N_{2(g)} + 3H_{2(g)} \rightarrow 2NH_{3(g)}$ is -85 kJ at 25°C . Calculate the internal energy change for this reaction.
6. Briefly explain bond energy.
7. Define the term partial molar free energy.
8. What are exact and inexact differentials ?
9. K_p for a reversible reaction at 25°C was found to be 0.14. Calculate the standard Gibb's free energy for this reaction.
10. Distinguish between true equilibrium and meta stable equilibrium.

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11. What is meant by desilverisation of lead ?
12. Give two examples each for deliquescent and efflorescent substances.
13. What is the mathematical form of Freundlich adsorption isotherm ? Represent it graphically.
14. What is Zeta potential ? How it is calculated ? (7×2=14)

SECTION – C

Answer any 4 questions out of 6. Each carries 3 marks.

15. Derive the equation for work done in a reversible isothermal expansion of an ideal gas.
16. Explain the variation of enthalpy of reaction with temperature using mathematical equations.
17. The efficiency of a heat engine is 42%. If it absorbs 500 J from the high temperature source at 300 K, find the temperature of the low temperature sink, work done and the heat rejected.
18. K_p for a reaction at 600 K is 1.6×10^{-4} . Calculate the K_p at 700 K if the standard heat of reaction in this temperature range is -100 kJ/mol.
19. Discuss on the two important electrokinetic phenomena of colloidal particles.
20. Explain the terms eutectic point and congruent melting point with suitable examples. (4×3=12)

SECTION – D

Answer any 2 questions out of 4. Each carries 5 marks.

21. Derive the (a) relation between temperature and pressure for a reversible adiabatic expansion of an ideal gas and (b) work done in a reversible adiabatic expansion of an ideal gas.
22. Describe the Carnot's cycle and derive an expression for efficiency of a heat engine.
23. Derive the Van't Hoff equation and from it arrive at its integrated form.
24. State Nernst distribution law and discuss its application to study association and dissociation of salt. (2×5=10)