



K22U 2291

Reg. No. : .....

Name : .....

V Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/  
Improvement) Examination, November 2022  
(2019 Admission Onwards)  
CORE COURSE IN CHEMISTRY/POLYMER CHEMISTRY  
5B10 CHE/PCH : Physical Chemistry – II

Time : 3 Hours

Max. Marks : 40

## SECTION – A

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

1. What are extensive properties ?
2. Define the term fugacity.
3. State the phase rule.
4. What is meant by Brownian movement ?

## SECTION – B

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

5. Distinguish between state function and path function.
6. State second law of thermodynamics.
7. What is meant by enthalpy of solution ?
8. Explain Joule Thomson effect.
9. Explain the Nernst heat theorem.
10. Write the van't Hoff equation and its integrated form.
11. What are the factors that influence the equilibrium ?

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12. Draw the phase diagram of water system.
13. Write an example each for a homogeneous and heterogeneous equilibrium.
14. What is meant by Flocculation value ?

## SECTION – C

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

15. Derive an expression for the work done in a reversible isothermal expansion of an ideal gas.
16. Explain briefly bond energy with an example.
17. One mole of an ideal mono-atomic gas expands reversibly from a volume of 10 dm<sup>3</sup> and temperature 298 K to a volume of 20 dm<sup>3</sup> and temperature 250 K. Assuming that  $C_v = 1.5 R$ . Calculate the entropy change for the process.
18. Define  $K_p$  and  $K_c$ . Derive the relation between them.
19. Derive an expression for Langmuir's adsorption isotherm.
20. Explain how Nernst distribution law is applicable in association and dissociation of solute.

## SECTION – D

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

21. a) State and explain Hess's law of constant heat summation. Discuss the applications of this law.  
b) Write and explain Kirchoff equation.
22. Discuss phase diagram of ferric chloride-water system.
23. a) Derive Gibbs-Helmholtz equation.  
b) One mole of an ideal gas is allowed to expand reversible and isothermally from a volume of 5 dm<sup>3</sup> to a volume of 50 dm<sup>3</sup> at 300 K. Calculate free energy change.
24. a) Explain electrical double layer and zeta potential.  
b) Discuss the electrokinetic properties of colloids.