K20U 1497

Reg. No. : .....

Name : .....

V Semester B.Sc. Degree (CBCSS – Reg./Sup./Imp.) Examination, November 2020
(2014 Admn. Onwards)
Core Course in Chemistry
5B09 CHE : PHYSICAL CHEMISTRY – I

Time : 3 Hours Max. Marks : 40

SECTION – A

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

1. Define most probable velocity.
2. Write any two examples for crystalline solids.
3. State Henry's law.
4. Define Van't Hoff factor. **(4×1=4)**

SECTION – B

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

5. Calculate the compressibility factor for a Van der Waals gas at its critical pressure.
6. What is meant by degrees of freedom of gas molecules ?
7. What is meant by surface tension ? How does it vary with temperature ?
8. Define optical density.
9. Define space lattice and unit cell.
10. What is Hall effect ?
11. What are semiconductors ?

P.T.O.

12. Differentiate between ideal and non-ideal solution.

13. State and explain the law of equipartition of energy.

14. How is osmotic pressure measurement used for the calculation of molecular weight of solute ? **(7×2=14)**

SECTION – C

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

15. Define critical pressure, critical temperature and critical volume of a gas.

16. Calculate the number of translational, vibrational and rotational degree of freedom if
    a) H_2O
    b) CO_2 and
    c) C_6H_6.

17. What is meant by coefficient of viscosity ? Discuss a method for its determination.

18. Explain rotating crystal method for X-ray diffraction studies.

19. Discuss magnetic properties of solids.

20. State Roult's law. Discuss deviation of real solution from ideal solution. **(4×3=12)**

SECTION – D

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

21. Discuss Kinetic model of gases. From Kinetic gas equation arrive at Charles' law, Boyle's law and Avogadro's law.

22. a) What are surface active agents ?
    b) Define parachor and discuss its application.

23. Discuss the law of constancy of interfacial angles, the law of constancy of symmetry and the law of rationality of indices.

24. What are colligative properties ? Explain the lowering of vapour pressure and depression in boiling point. **(2×5=10)**