21U206 (Pages: 2) Name: ....

Reg.No: ....

SECOND SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2022
(CBCSS - UG)
(Regular/Supplementary/Improvement)
CC19U CHE2 C02 - PHYSICAL CHEMISTRY
(Chemistry - Complementary Course)
(2019 Admission onwards)

Time : 2.00 Hours   Maximum : 60 Marks

Credit : 2

Part A (Short answer questions)
Answer *all* questions. Each question carries 2 marks.

1. Define path function. Give an example.

2. Give the mathematical formulation for first law of thermodynamics

3. Define standard Gibbs energy change.

4. Define ideal gas.

5. Give the van der Waals' equation for n molecules of a gas and explain the terms.

6. Define unit cell.

7. State the law of constancy of interfacial angles

8. Give the Bragg equation and state the terms involved.

9. How does the vapour pressure of a liquid affect on temperature?

10. How does pressure affect the solubility of a gas in a given liquid?

11. What is meant by reverse osmosis?

12. What is meant by a reference electrode? Give one example.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)
Answer *all* questions. Each question carries 5 marks.

13. Calculate the entropy fusion of ice if its enthalpy of fusion at 273 K is 335 J/g.

14. Discuss the effect of temperature on the distribution of molecular velocities.

15. What are the characteristics of cholesteric liquid crystals?

16. Calculate the molarity of a glucose solution (molar mass=180gmol-1) which shows an osmotic pressure of 2.465 atm at 27°C.

17. Explain how the molecular mass of a non-volatile solute is determined by osmometry.

18. What is meant by molar conductance of an electrolyte solution? How does it vary with dilution for (i) a stong electrolyte and (ii) for a weak electrolyte? Explain.

19. Give the Nernst equations for single electrode potential and cell potential and explain the terms involved.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

20. (a) Define the term Gibbs energy.

    (b) Show that decrease in Gibbs free energy in a process is equal to the useful work done by the system.

21. (a) What are buffer solutions?

    (b) Explain the term' buffer action'.

    (c) Give an example each for two types of buffer solutions and explain the action of each.

    (d) Explain the significance of buffer solutions.

(1 × 10 = 10 Marks)

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