21U208S (Pages: 2) Name: ……..

Reg. No……

SECOND SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2022

(CUCBCSS-UG)

CC15U CHE2 C02 - PHYSICAL CHEMISTRY - I

(Chemistry - Complementary Course)

(2016 to 2018 Admissions – Supplementary/Improvement)

Time: Three Hours Maximum: 64 Marks

Section A

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

1. The number of particles per unit cell of bcc is …….
2. The SI unit of van der Waals constant 'a' is …….
3. Among heat, internal energy and entropy ……. is not a state function?
4. For an irreversible process, $\Delta S_{System} + \Delta S_{Surroundin\ gs}$ is …….
5. When 8 kJ of work is done on the system and 3kJ heat is given out by the system, ΔU =
6. The oxidation potential of hydrogen electrode is taken as …….
7. Melting point of ice ……. with increase of pressure.
8. Liquids with high intermolecular forces have ……. viscosity.
9. The total number of Bravais lattices in 3-dimensional space is …….
10. During the condensation of a gas, entropy …….

(10 × 1 = 10 Marks)

Section B

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

11. Write Van-der waals gas equation and explain.
12. Define second law of thermodynamics.
13. What is Frenkel defect?
14. What is entropy criterion for spontaneity?
15. Define specific conductance.
16. Define entropy of sublimation.
17. What is Gibb's energy?
18. What is a half-cell reaction?
19. Define Ostwald's dilution law.
20. What are miller indices?

(7 × 2 = 14 Marks)

Section C

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

21. Discuss symmetry elements in crystals.
22. Draw lattice planes (111), (100), (010) and (001) in a cube
23. What are redox electrodes? Explain the working of fuel cell.
24. What are buffer solutions? Discuss the applications of buffers
25. Discuss how real gases deviate from ideal gas behavior.
26. State and explain the first law of thermodynamics.

(4 × 5 = 20 Marks)

Section D

Answer any ***two*** questions. Each question carries 10 marks.

27. Discuss defects in solids
28. Discuss the principle and applications of conductometric titrations
29. What is Raoult's law? Discuss the factors affecting responsible for the deviation from this law by taking suitable examples
30. Derive Bragg's equation. The wavelengths of first-order X-rays are 2.20 Å at 27°8'. Find the distance between the adjacent Miller planes.

(2 × 10 = 20 Marks)

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