22100917

QP CODE: 22100917

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS, APRIL 2022

Sixth Semester

CORE COURSE - CH6CRT12 - PHYSICAL CHEMISTRY - IV

Common for B.Sc Chemistry Model I, B.Sc Chemistry Model II Industrial Chemistry & B.Sc Chemistry Model III Petrochemicals

2017 Admission Onwards

A0D8F0F7

Time: 3 Hours Max. Marks : 60

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. Define Raoult's law.
2. Why glycol - water mixture is used in a car radiator while driving through a colder region having sub-zero temperature?
3. The molar conductivity of a 0.1 M solution of an electrolyte was found to be 102 ohm^{-1} cm^2 mol^{-1} and at infinite dilution, it is found to be 400 ohm^{-1} cm^2 mol^{-1}. Calculate the degree of dissociation.
4. How is ionic conductance related to temperature?
5. What is meant by electrolytic cells?
6. Represent SHE when it functions as cathode.
7. Represent the relationship between $\Delta S°$ and $E°_{cell}$.
8. What are fuel cells?
9. Explain quinhydrone electrode.
10. Can quantum yield of a photochemical reaction be different from unity. Why?
11. Define S_2 improper axis of rotation.

12. List out the symmetry elements present in C_{3V} point group.

(10×1=10)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. Explain the terms critical solution temperature ,upper critical solution temperature ,lower critical solution temperature and conjugate solutions.
14. What is abnormal molecular mass? Discuss it relating to molecular association and dissociation?
15. Explain Hittorf method with inert electrodes used for the determination of transference number.
16. Explain Debye-Huckel theory of strong electrolytes.
17. What is electrochemical series? Briefly explain two of its uses.
18. Write a short note on potentiometric titrations of acid-base and redox reactions.
19. State and explain Stark- Einstein law. Calculate the energy of an einstein of radiation of wavelength 3000 A^0.
20. Draw Jablonsky diagrm and explain fluorescence and phosphorescence.
21. Identify the point group to which BF_3 and H_2O belong and explain why?

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **10** marks.*

22. State and explain Henry's law. Discuss its applications and limitations.
23. Write a note different types of conductometric titrations.
24. What is meant by corrosion? Briefly describe the methods for monitering and prevention of corrosion.
25. Define the terms symmetry, symmetry operations and symmetry elements. Explain five symmetry elements with examples.

(2×10=20)