UN – 343-R

V Semester B.Sc. Examination, November/December 2015
(OS) (Prior to 2013-14)
CHEMISTRY – VI
Physical Chemistry

Time : 3 Hours Max. Marks : 60

Instructions : *i) The question paper has **two** Parts.*
*ii) Answer **both** the Parts.*

PART – A

Answer **any six** of the following questions. **Each** question carries **two** marks. **(6x2=12)**

1. How does Specific conductance vary with dilution and temperature?
2. Mention the advantages of potentiometric titrations.
3. Define solubility product.
4. What is Liquid Junction potential ? How it is eliminated ?
5. Write Biological Applications of Buffer solutions.
6. What is chemiluminescence ?
7. What is salt bridge ? What is its function in galvanic cells ?
8. Write Clausius – Mossoti equation.
9. Explain the term Magnetic susceptibility.
10. State Born-Oppenheimer approximation.

PART – B

Answer **any eight** of the following questions. **Each** question carries **six** marks. (8×6=48)

11. a) Define :

    a) Electrophoretic effect

    b) Asymmetric effect.

    b) What are the factors that favours the degree of dissociation ? (4+2)

12. a) What are conductometric titrations ? Explain the conductometric titrations between Strong Acid and Strong Base.

    b) What are concentration cells ? (4+2)

13. a) How do you determine the pH of a solution using glass electrode ?

    b) Give two limitations of quinhydrone electrode. (4+2)

14. a) What is meant by hydrolysis of salts ? Derive the expression for pH of the salt solution obtained by mixing Strong Acid and Weak Base.

    b) Explain Common-ion effect with example. (4+2)

15. a) Derive Nernst equation for single electrode potential.

    b) Calculate molar conductance of NH_4OH at infinite dilution. Given ; $\Lambda_\infty NH_4Cl$, $\Lambda_\infty(OH^-)$ and $\Lambda(Cl^-)$ are 130×10^{-4}, 174×10^{-4} and 66×10^{-4} Sm^2/mol respectively. (4+2)

16. a) Explain the terms Fluorescence and Phosphorescence with examples.

    b) State Beer-Lambert's law. (4+2)

17. a) Derive the expression used to calculate pH of an acidic Buffer solution.

    b) What is the effect of temperature on degree of hydrolysis ? (4+2)

18. a) What is dipole moment ? Write the different applications of dipole moment.

    b) What is zero-point energy ?

    (4+2)

19. a) State Hooke's law. Derive the expression for the frequency of simple hormonic oscillator.

    b) What are paramagnetic substances ?

    (4+2)

20. a) Explain Stoke's and Antistoke's law in Raman Spectra.

    b) State Franck-Condon Principle.

    (4+2)

21. a) State two laws of photochemistry.

    b) What are chemical sensors ?

    (4+2)

22. a) Explain the steps involved in the process of dimerisation of Anthracene.

    b) What is meant by photostationary equilibrium ?

    (4+2)
