Q1. Choose the correct answer.

1 .A filtration process could be very time consuming if it were not aided by a gentle suction which is developed:

(A)If the paper convers the funnel upto its circumference

(B)If the paper has got small sized pores in it

(C)If the stem of funnel is large so that it dips into the filtrate

(D)If the paper fits tightly

2.Insoluble particles can be separated from liquid by:

(A)Sublimation (B)Solvent extraction (C)Crystallization (D)Filtration

3.The limiting line of Balmer series lies in:

(A)Visible region (B)U.V region (C)I.R region (D)X-rays region

4.When 6d orbitals is complete, the entering electrons goes into:

(A)7f (B)7s (C)7p (D)7d

5.What is the value of (n+f) for the 3^{rd} sub-shell?

(A)3 (B)4 (C)5 (D)6

6.Percentage ionic character of HF is:

(A)100% (B)80% (C)43% (D)57%

7.Dipole moment of CO_2 is:

(A)1.25D (B)1.85D (C)3.1D (D)Zero

8.In the ground state of an atom the electron is present:

(A)In the nucleus (B)In the second shell

(C)Nearest to the nucleus (D)Farthest from the nucleus

9.Azeotropic mixture of two liquids boils at a lower temperature than either of them, when:

(A)It is saturated (B)It is metastable

(C)It shows positive deviation from Raoult's Law

(D)It shows negative deviation from Raoult's Law

10.Which of the following solutions has the highest boiling point?

(A)5.85% solution of sodium chloride (B)18.0% solution of glucose

(C)6.0 solution of urea (D)All have the same boiling point

11.Colligative properties are the properties of:

(A)Dilute solutions which behave as nearly ideal solution

(B)Concentrated solutions which behave as nearly non-ideal solutions

(C)Botha a and b (D)Neither a nor b

12.Oxidation number of phosphorus in the compound (HPO_3) is:

(A)+3 (B)+4 (C)+5 (D)+6

13.Cathode in NICAD cell is of:

(A)Ag_2O (B)Zn (C)Cd (D)NiO_2

14.If the rate equation of a reaction 2A+B→ to products is, rate = $k[A]^2[B]$,and A is present in large excess, then order of reaction is:

(A)1 (B)2 (C)3 (D)None of these

15.Photochemical reaction are usually::

(A)Zero order (B)First order (C)Second order (D)Third order

16.Half-life period for $\mathbf{U^{235}_{92}}$ is:

(A)710 million years (B)720 million years

(C)810 million years (D)820 million years

17.The enzyme used for Hydrolysis of urea is:

(A)Invertase (B)Urease (C)Lipase (D)Zymas

Q2. Write short answers of the following questions.

1.Give the salient features of an ideal solvent used in the process of crystallization.

2.What is solvent extraction? Give its importance.

3.Differentiate between stationary and mobile phase used in chromatography.

4.Define chromatography. Give formula of distribution coefficient.

5.What is J.J Thomson's experiment for determining e/m value of electron?

6.Why is the e/m value for the positive rays always smaller than that of cathode rays?

7.How neutron hit on Cu, Give reaction.

8.Differentiate between continuous and line spectrum.

9.Describe Zeeman's and Stark's effect.

10.How are x-rays produced?

11.Define (n+l) rule and Pauli's Exclusion principle.

12.Why second I.E of an element is always greater than first I.E?

13.The dipole moment of CO_2 is zero and that of water is 1.85 D. Give reason.

14.What are Debye forces? Explain.

15.Explain Relative lowering of vapour pressure is independent of the temperature. with reactions.

16.What is physical significance of K_b and K_f values of solvents?

17.The presence of non-volatile solutes increases the boiling point of solvent. Give reason.

18.Define hydration and hydrolysis.

19.Write any two application of boiling point elevation.

20.The oxidation state of oxygen in +2 in OF_2. justify it.

21.What is salt bridge? How it maintains electrical neutrality in the half cell solution.

22.Voltaic cell is Reversible Cell State.

23.A porous plate or a salt bridge is not required in lead storage cell.

24.What is meant by Standard Hydrogen Electrode (SHE)?

25.How relative chemical reactivity of metals is studied with the help of electrochemical series.
26.What is Pseudo First Order Reaction? Give an example.
27.Write names of physical methods to determine the rate of reaction.
28.What is necessary for a collision between reactant molecules to be effective?
29.Define negative catalyst with an example.
30.What is meant by a statement “catalyst for catalyst”?

Q3. Write detailed answers of the following questions.

1.Calculate Radius of a Bohr’s atom using Bohr’s atomic model.
2.Discuss magnetic and spin quantum numbers.
3.Explain dipole moment. How it is units. How does it explain the geometry of and Molecules?
4.Discuss Raoult’s Law for the solution in which both components are volatile.
5.Outline the important industrial applications of electrolysis. Write the electrochemical reactions involved.
6.How does the Arrhenius equation help us to calculate the energy of activation of a reaction?