CHEMISTRY – PARER – I

(English version)

MODEL QUESTON PAPER

(For the Academic year 2021-22 only)

Time : 3 Hours **Max:Marks:60M**

SECTION – A

I. Very Short Answer Type Questions: Answer Any Ten of the following Questions: 10×2 = 20 M

1. In terms of period and group where would you locate the element Z = 114?
2. Electron affinity of chlorine is more than that of fluorine. Explain.
3. Predict the change if any in hybridization of Al atom in the following reaction

$$AlCl_3 + Cl^- \rightarrow AlCl_4^-$$

4. If A and B are two different atoms when does AB molecule become covalent?
5. Dipole moment of $NH_3 > NF_3$. Why?
6. What is Boltzmann Constant? Give its value?
7. What is a disproportionation reaction ? Give example
8. Which gas diffuses faster among N_2, O_2 &CH_4. Why?
9. Calculate the volume of CO_2 liberated when 4 gram of $CaCO_3$ is heated.
10. State the third law of thermodynamics.
11. Calculate pH of 0.05 M $Ba(OH)_2$
12. Define inert pair effect.
13. Lithium salts are mostly hydrated. Why?
14. Mention the uses of 'Mg' metal.
15. Write the reagent required for conversion of benzene to methyl benzene.

SECTION – B

II. Short Answer Type Questions: Answer Any Six of the following Questions: 6×4 = 24 M

16. Give differences between emission and absorption spectra.
17. Write the postulates of kinetic molecular theory of gases.

18. What is Lanthanide Contraction? Give its consequences.

19. Explain the hybridization involved in PCl_5 molecule.

20. Derive ideal gas equation

21. Balance the following redox equation by ion-electron method taking place in acidic medium.

$$Fe^{+2} + Cr_2O_7^{-2} \rightarrow Fe^{+3} + Cr^{+3}$$

22. A compound having 4.07% hydrogen, 24.27% carbon and 71.65% chlorine. Its molecular weight is 98.96 what are its empirical formula and molecular formula.

23. State and explain Hess's law of constant heat summation

24. Write conjugate acid and bases for following species.

i. OH^-

ii. NH_3

iii. HSO_4^-

iv. H_2O

25. Discuss the application of Lechatelier's principle for the industrial synthesis of SO_3,

26. What is hard water ? Write a note on calgon method for the removal of hardness of water.

27. What are electron deficient compounds ? Is BCl_3 an electron deficient species. Explain.

28. Explain the difference in properties of diamond and graphite on the basis of their structure.

29. Give the examples each for position and functional isomerism.

SECTION – C

III. Long Answer Type Questions: Answer Any Two of the following Questions: 2× 8 = 16 M

30. How are the quantum numbers n, l and m, s arrived at? Explain the significance of these quantum numbers?

31. Define IE_1 and IE_2 ? Why is $IE_2 > IE_1$ for a given atom? Discuss the factors that effect IE of an element?

32. Give an account of VSEPR Theory, and its applications?

33. Describe any two methods of preparation of Ethylene ? How does C_2H_4 react with

a) H_2O/H^+

b) $O_3 + H_2O$ in presence of Zinc

c) Cl_2 in CCl_4

d) HCl