TSBIE - MODEL PAPER
CHEMISTRY - I

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

Each Question Carries TWO marks. 2 x 10 = 20

SECTION - A

1. What is Lanthanide Contraction? Give one of its consequences.
2. Which of the two ions Ca^{2+} or Zn^{2+} is more stable and why?
3. What is Boltzman's constant? Give its value.
4. Calculate the weight of 0.1 mole of sodium carbonate.
5. What is homogenous equilibrium? Write two homogenous reactions.
6. Lithium salts are mostly hydrated. Why?
7. What happens when magnesium burnt in air?
8. Diamond has high melting point – explain.
9. What is the effect of water on tin (Sn)?
10. Write the structure of a) Neopentane b) Trichloro ethanoic acid.

SECTION - B

Each Question Carries FOUR marks. 6 x 4 = 24

11. Explain the differences between emission and absorption spectrum.
12. Balance the following reaction by ion electron method.

$$Cr_2O_7^{-2} + SO_3^{-2} \xrightarrow{H^+} Cr^{3+} + SO_4^{-2}$$

13. Write the postulates of Kinetic Molecular theory of gases.
14. State Boyl'es law, Charle's law and Avagadro's law and derive Ideal gas equation.
15. Chemical analysis of a carbon compound gave the following percentage composition by weight of the elements present, carbon = 10.06%, hydrogen = 0.84%, chlorine = 89.10%, Calculate the empirical formula of the compound.

16. State and explain Hess's law of constant heat summation.
17. Drive the relation between Kp & Kc for the equilibrium reation.
    N_2 (g) + $3H_2$ (g) $\rightleftharpoons$ $2NH_3$ (g)
18. What is conjugate acid-base pair? Illustrate with example.
19. How the hardness of water is removed by Calgon method.
20. What are electron deficient compounds? Is $AlCl_3$ an electron deficient species? Explain.
21. What do you understand by a) Allotropy b) Inert pair effect c) Catenation.
22. Give two examples each for poisition and functional group isomerism.

SECTION - C

Each Question Carries EIGHT marks. 2 x 8 = 16

23. How are the quantum numbers n, l and m arrived at? Explain the significance of these quantum numbers.
24. Define IE_1 and IE_2. Why is $IE_2 > IE_1$ for an atom? Dicsuss 3 factors effecting IE of an element.
25. Define hybridisation. Explain different types of hybridisation involving s and p orbitals.
26. Give 2 methods of prepration of Acetylene. How does it react with water and Hydrogen bromide.