V–2–A

Roll No.....

Total No. of Questions : **27**]

[*Total No. of Printed Pages* : **7**

XIAPBAJKL23
10102–A
CHEMISTRY

Time : 3 Hours]

[Maximum Marks : 70

(Very Short Answer Type Questions) 1 each

1. Describe briefly the structure of Ethyne.

2. Which of the following radical is more stable ?

$(CH_3)_3C$, CH_3CHCH_3, CH_3CH_2

3. Which isotope of hydrogen is radioactive ?

4. What are Interstitial Hydride ?

5. ΔH for a spontaneous process is positive or negative.

(Short Answer Type Questions–I) 2 each

6. Write the oxidation state of the underlined element :

   (i) $K_2\underline{Cr}_2O_7$

   (ii) $K\underline{Mn}O_4$

7. Define Biodegradable Pollutants.

8. Write structural difference between diamond and graphite.

9. Predict hybridization and shape of the following molecule :

   (i) CH_4

   (ii) BF_3

10. Define the term electron gain enthalpy and explain its trends along the period and down the group.

11. Explain magnetic quantum number.

12. Write the emperical and molecular formula of the following compound :

   (i) Benzene

   (ii) Acetic acid

(Short Answer Type Questions—II) 3 each

13. Explain the law of conservation of mass with examples.

14. State and explain de-Broglie equation.

15. Give the difference between bonding and antibonding molecular orbitals.

16. Define the term ionization enthalpy. Why ionization enthalpy of Be is more than B ?

17. On a ship sailing in Pacific ocean where temperature is 23.4°C, a balloon is filled with 2 litre of air. What will be the volume of the balloon when the ship reaches Indian ocean where temperature is 26.1°C ?

18. Explain Boyle's law and also its significance.

19. Explain the following :

    (i) Enthalpy of a system

    (ii) Entropy of a system

20. Explain the manufacture of Na_2CO_3 by Ammonia-Solvay process.

21. How are alkenes prepared from alcohols ? How does propene react with :

(i) HBr

(ii) H_2O in presence of H_2SO_4 (in absence of peroxides)

22. Teacher asked the students not to expose the sodium metal to air. Why ? Teacher again asked the students to burn the Mg ribbon but it catches no fire then teacher asked them to rub the ribbon with sand paper and then it catches fire. Why ?

23. Explain the acidic nature of Boric acid and give *two* uses of it.

24. Sometimes a red colour is not produced in the Lassaigne's test even if both N and S are present in the organic compound explain. Why ?

Or

Explain the principle of column chromatography.

(Long Answer Type Questions)

25. Explain the following :

(i) Electrophile

(ii) Nucleophile

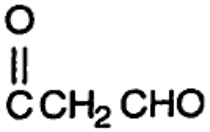
(iii) Reaction intermediate

(iv) Inductive effect

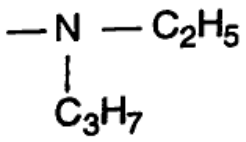
(v) Electromeric effect

Or

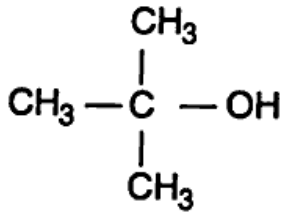
Give the IUPAC names of the following compounds :

(i) 

(ii) CH_2Cl $CHCl_2$

(iii) 

(iv) $CH_2 = CH - CH = CH - C \equiv CH$

(v)


26. Define Conformation. Discuss the conformation of Ethane with various methods out of staggard and eclipsed which is more stable.

Or

Give the following reactions of Benzene :

(i) Halogenation

(ii) Sulphonation

(iii) Nitration

(iv) Friedel-Crafts reaction

27. State and explain Le-Chatelier principle and predict the effect of temperature and pressure in the following reactions :

(i) $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$; $\Delta H = 92.4$ kJ mol^{-1}

(ii) $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$; $\Delta H = +180.7$ kJ mol^{-1}

Or

Explain the following :

(i) Solubility product

(ii) Common ion defect

(iii) Acid and base with Bronsted-Lowry concept