

PART - I

1. **Assertion :** Monoclinic sulphur is an example of monoclinic crystal system.
Reason : For a monoclinic system, $a \neq b \neq c$ and $\alpha = \gamma = 90^\circ, \beta \neq 90^\circ$.
 (a) Assertion is true but Reason is false.
 (b) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 (c) Both Assertion and Reason are false.
 (d) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
2. **IUPAC name of the complex $K_3[Al(C_2O_4)_3]$ is :**
 (a) Potassium trisoxalato aluminate (III)
 (b) Potassium trioxalato aluminium (III)
 (c) Potassium trioxalato aluminate (III)
 (d) Potassium trioxalato aluminate (II)
3. **Which of the following; is the strongest acid among; all ?**
 (a) HBr (b) HI
 (c) HCl (d) HF
4. **Which of the following is not sp^2 hybridised ?**
 (a) Fullerene (b) Graphite
 (c) Dry ice (d) Graphene
5. **The pyrimidine bases present in RNA are :**
 (a) Cytosine and Thiamine
 (b) Cytosine and Adenine
 (c) Cytosine and Uracil
 (d) Cytosine and Guanine
6. **Aspirin is :**
 (a) chlorobenzoic acid
 (b) acetyl salicylic acid
 (c) anthranilic acid
 (d) benzoyl salicylic acid
7. **In acid medium, potassium permanganate oxidizes oxalic acid to :**
 (a) acetate (b) oxalate
 (c) acetic acid (d) carbon dioxide
8. **When aniline reacts with acetic anhydride, the product formed is :**
 (a) p-aminoacetophenone
 (b) o-aminoacetophenone
 (c) acetanilide
 (d) m-aminoacetophenone
9. **Among the following which will not be hydrolysed ?**
 (a) Sodium Chloride
 (b) Sodium Formate
 (c) Ammonium Formate
 (d) Ammonium Nitrate
10. **Among the following cells primary cells are :**
 (i) Leclanche cell (ii) Nickel-Cadmium cell
 (iii) Lead Storage Battery (iv) Mercury cell
 (a) (iii) and (iv) (b) (i) and (iv)
 (c) (ii) and (iii) (d) (i) and (iii)
11. **The formation of cyanohydrin from acetone is an example of :**
 (a) electrophilic addition
 (b) nucleophilic substitution

- (c) nucleophilic addition,
(d) electrophilic substitution

12. The rate constant of a reaction is $5.8 \times 10^{-2} \text{ s}^{-1}$. The order of the reaction is :

- (a) Second order (b) First order
(c) Third order (d) Zero order

13. In the electrolytic refining of copper, which one of the following is used as anode?

- (a) Carbon rod (b) Pure copper
(c) Platinum electrode (d) Impure copper

14. Activity of iron catalyst is increased by the ____ compound.

- (a) CH_3COOH (b) H_2S
(c) Al_2O_3 (d) As_2O_3

15. The oxidising agent used to stop the oxidation of primary alcohol at the aldehyde stage is :

- (a) $\text{Na}_2\text{Cr}_2\text{O}_7$ (b) KMnO_4
(c) $\text{K}_2\text{Cr}_2\text{O}_7$ (d) PCC

PART – II

16. What is Calcination?

17. How will you convert boric acid to boron nitride?

18. Sulphuric acid is a dehydrating agent. Justify with an example.

19. Explain common ion effect with an example.

20. Can Fe^{3+} oxidise bromide to bromine under Standard Conditions ?

Given :

$$E^\circ_{\text{Fe}^{3+}|\text{Fe}^{2+}} = 0.771 \text{ V}$$

$$E^\circ_{\text{Br}_2|\text{Br}^-} = 1.09 \text{ V}$$

21. Write Kolbe's reaction.

22. Write the structure of the following:

- α - D-glucopyranose and
 β -D-glucopyranose

23. What are antibiotics ?

24. What is an order of a reaction ?

PART – III

25. Give the uses of helium.

26. Which is more stable Fe^{3+} or Fe^{2+} ? Why ?

27. Aluminium crystallizes in a cubic close packed structure. Its metallic radius is 125 pm. Calculate the edge length of unit cell.

28. Write Arrhenius equation and explain the terms involved.

29. Explain the effect of temperature and pressure on physisorption and chemisorption.

30. Explain Knoevenagel reaction.

31. Write the reaction of primary amine with Carbon disulphide (CS_2).

32. Write a short note on peptide bond.

33. In the complex, $[\text{Co}(\text{CN})_2\text{Cl}_2]\text{Cl}$, identify the following.

- (i) IUPAC name
(ii) Central metal ion
(iii) Co-ordination number

PART – IV

34. (a) (i) What are the differences between minerals and ores ?

(ii) What is the role of silica in the extraction of copper?

OR

(b) (i) Give the uses of Boric acid.

(ii) What are silicates?

35. (a) What is Lanthanoid Contraction and what are the consequences of Lanthanoid Contraction ?

OR

(b) (i) Write a short notes on double salts and co-ordination compounds.

(ii) Give an example of Coordination Compound used in medicine and a biologically important Coordination Compound.

36. (a) Calculate the percentage efficiency of packing in case of simple cubic crystal.

OR

(b) (i) Derive the integrated rate law for a Zero order reaction, $A \rightarrow \text{product}$.

(ii) Define buffer Index.

37. (a) (i) Explain about Galvanic cell notation.

(ii) Define gold number.

OR

(b) Write notes on Lucas Test.

38. (a) (i) How acetic acid is prepared from Grignard reagent ?

(ii) What are bio-degradable polymers ? Give an example.

OR

(b) An organic Compound (A) of molecular formula C_2H_4O reacts with $Zn - Hg/Conc. HCl$ to give Compound (B) which reacts with HNO_3 forming Compound (C) (as major product) and Compound (D). Compound (C) reacts with conc. HCl to give Compound (E) (Table vinegar) and hydroxylamine. Identify A, B, C, D and E with suitable reactions.

