

## PART - I

### 1. Match the following: -

- |               |                                            |
|---------------|--------------------------------------------|
| (1) Fluorine  | (i) Identification of coloured metal ions  |
| (2) Borax     | (ii) Strong oxidising agent                |
| (3) Aluminium | (iii) Chalcogens Present in volcanic ashes |
| (4) Sulphur   | (iv) Most abundant element                 |

- (a) (1) -(iii), (2) -(ii), (3) -(iv), (4)-(i)  
 (b) (1) -(ii), (2) -(i), (3) -(iv), (4)-(iii)  
 (c) (1) -(iv), (2) -(iii), (3) -(ii), (4)-(i)  
 (d) (1) -(ii), (2) -(iv), (3) -(i), (4)-(iii)

### 2. Wolframite ore is separated from tinstone by the process of.

- (a) Electromagnetic separation  
 (b) Smelting  
 (c) Calcination  
 (d) Roasting

### 3. The transition element which has only +3 oxidation state is.

- (a) Ni (b) Mn  
 (c) Cr (d) Sc

### 4. The medicinal value of a drug is measured in terms of its.

- (a) Deoxyribose (b) Gold number  
 (c) Therapeutic index (d) Equilibrium constant

### 5. The aqueous solutions of sodium formate, anilinium chloride and potassium cyanide are respectively.

- (a) acidic, acidic, acidic  
 (b) acidic, acidic, basic  
 (c) basic, acidic, basic  
 (d) basic, neutral, basic

### 6. If one strand of the DNA has the sequence 'ATCCTTCA', then the sequence of complementary strand would be.

- (a) TACGRAGT (b) TACGAACT  
 (c) TCCGAACT (d) TACGTACT

### 7. Which one of the following is most basic?

- (a) 2, 4-dibromo aniline  
 (b) 2,4-dichloro aniline  
 (c) 2, 4-dimethyl aniline  
 (d) 2,4-dinitro aniline

### 8. How many Faradays of electricity are required for the following reaction to occur $\text{MnO}_4^- \rightarrow \text{Mn}^{2+}$ ?

- (a) 7 F (b) 5 F  
 (c) 3 F (d) 1 F

### 9. Assertion: - p-N, N-dimethyl aminobenzaldehyde undergoes benzoin condensation.

Reason: - The aldehydic (-CHO) group is meta directing.

- (a) Both Assertion and Reason are false.  
 (b) Both Assertion and Reason are true, and Reason is the correct explanation of Assertion.  
 (c) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.  
 (d) Assertion is true, but Reason is false.

### 10. Laptops have: -

- (a) Lead storage battery  
 (b) Fuel cell  
 (c) Mercury button cell  
 (d) Lithium-ion battery

### 11. Formula for hyponitrous acid: -

- (a) HOONO (b)  $\text{H}_2\text{N}_2\text{O}_2$   
 (c)  $\text{HNO}_2$  (d)  $\text{HNO}_4$

### 12. Williamson synthesis of preparing dimethyl ether is a/an: -

- (a) Electrophilic substitution reaction

- (b) S<sub>N</sub>1 reaction
- (c) S<sub>N</sub>2 reaction
- (d) Electrophilic addition reaction

13. The vacant space in bcc lattice unit cell is: -

- (a) 26%                      (b) 48%
- (c) 23%                      (d) 32%

14. Time required for the reactant concentration to reach one half of its initial value is called: -

- (a) half-life period                      (b) first order
- (c) zero order                      (d) second order

15. The major product obtained when phenol reacts with Con.H<sub>2</sub> SO<sub>4</sub> at 280 K is: -

- (a) Salicylic acid
- (b) Picric acid
- (c) o-phenol sulphonic acid
- (d) p-phenol sulphonic acid

### PART - II

16. How is bleaching powder prepared?

17. Classify the following elements into d-block and f-block elements: -

- (i) Tungsten                      (ii) Ruthenium
- (iii) Promethium                      (iv) Einsteinium

18. Write any two hydrate isomers of the complex with the molecular formula CrCl<sub>3</sub>6H<sub>2</sub>O.

19. If the no. of close packed sphere is 6, calculate the number of Octahedral voids and Tetrahedral voids generated.

20. What are Lewis's acids and bases? Give an example for each.

21. Write the dispersed phase and dispersion medium of butter.

22. Name the catalyst used in Rosenmund reduction and state its importance.

23. How is chloropicrin prepared?

24. Why is C-O-C bond angle in ether slightly greater than the tetrahedral bond angle?

### PART - III

25. Write the Chromyl Chloride Test.

26. [Sc (H<sub>2</sub>O)<sub>6</sub>]<sup>3+</sup> is colourless - Explain.

27. Derive Henderson equation.

28. How are metals protected from corrosion by cathodic protection method?

29. Mention the shapes of the following colloidal particles.

- (i) As<sub>2</sub>S<sub>3</sub>
- (ii) Blue gold sol
- (iii) Tungstic acid sol

30. Formic acid reduces Tollen's reagent whereas acetic acid does not reduce. Give reason.

31. How are proteins classified based on their structure? Explain.

32. State any three advantages of food additives.

33. There is only a marginal difference in decrease in ionisation enthalpy from Aluminium to Thallium - Explain why?

### PART - IV

34. (a) Explain zone refining process.

OR

- (b) (i) Write any two conditions for catenation.
- (ii) Why HF cannot be stored in glass bottles?

35. (a) (i) Write the molecular formula and draw the structure of sulphurous acid and Marshall's acid.

(ii) Write the IUPAC name of the following: -

- (A) [Ag (NH<sub>3</sub>)<sub>2</sub>]
- (B) [Co (NH<sub>3</sub>)<sub>5</sub>Cl]<sup>2+</sup>

OR

- (b) (i) Calculate the magnetic moment and magnetic property of [CoF<sub>6</sub>]<sup>3-</sup>
- (ii) Write a note on Frenkel defect.

36. (a) Derive integrated rate law for a first order reaction  $A \rightarrow \text{product}$ .

OR

(b) (i) Write the pH value of the following substances: -

- (a) Vinegar
- (b) Black coffee
- (c) Baking soda
- (d) Soapy water

(ii) A conductivity cell has two platinum electrodes separated by a distance of 1.5 cm and the cross-sectional area of each electrode is 4.5sq.cm. Using this cell, the resistance of 0.5 N electrolytic solution was measured as 15 chms. Find the specific conductance of the solution.

37. (a) (i) Give any three differences between chemisorption and physisorption.

(ii) What is Vulcanization?

OR

(b) (i) Give the coupling reaction of phenol.

(ii) How will you prepare the following by using Grignard reagent?

- (a) propan-1-ol      (b) propan-2-ol

38. (a) (i) What is Formalin? What is its use?

(ii) What is glycosidic linkage?

OR

(b) (i) What is Gomberg reaction? Explain.

(ii) Identify A and B.

