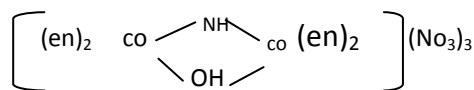


- All questions are compulsory.
- Use log table of necessary. Use of calculators is not allowed.

Section-A

1. How do metallic and ionic substances differ in conductivity of electricity?
2. What is the coagulation process?
3. What is meant by the term pyrometallurgy?
4. Give the IUPAC name of the following compound.

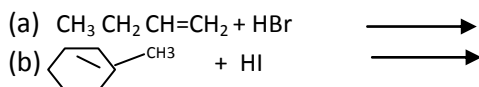


5. Why carboxylic acid with even c-atom has high melting point then odd.
6. Why is red phosphorus less reactive than white phosphorus?
7. Arrange the following compound in an increasing order of basic strength in their aqueous solution. NH_3 , CH_3NH_2 , $(\text{CH}_3)_2\text{NH}$, $(\text{CH}_3)_3\text{N}$
8. What is the primary structural feature necessary for a molecule to make it useful in a condensation polymerization reaction?

Section-B

9. What type of cell is a lead storage battery? Write the anode and the cathode reaction and the overall cell reaction of lead storage battery.
10. Explain why the rate of reaction becomes double with rise in every 10°C temperature.
11. Describe the underlying principle of each of the following metal refining methods:-
(a) Zone refining (b) Van-Arkel method.
12. Explain the following facts giving appropriate reason in each case:-
(a) NF_3 is an exothermic compound whereas NCl_3 are not equivalent.
(b) All the bonds in SF_4 are not equivalent.
13. Complete the following chemical reaction :-
(a) $\text{Cr}_2\text{O}_7^{2-} + \text{I}^- + \text{H}^+ \longrightarrow$
(b) $\text{MnO}_4^- + \text{NO}_2^- + \text{H}^+ \longrightarrow$
14. Explain the following behavior:-
(a) Alcohols are more soluble in water than the hydrocarbon of comparable masses
(b) Ortho – nitro phenol is more acidic than ortho – methoxy phenol.
15. What is meant by (a) peptide linkage (b) non-reducing sugar
16. Name the two fat soluble vitamins, their sources and the diseases caused due to their deficiency in diet.
17. How will you prepare the following:-
Buna-s and Nylon-6

18. Complete the following reactions:-

**Section-C**

19. Silver crystallizes in face-centre unit cells. Each side of the unit cell has a length of 409 pm. What are the radius of an atom of silver (assuming that each face atom is touching the four corner atoms.).
20. A copper-silver cell is set up. The copper ion concentration in it is 0.10M. The concentration of silver is not known. The cell potential measured is 0.422V. Determine the concentration of silver in the cell. Given $E^\circ \text{Ag}/\text{Ag}^+ = -80\text{V}$ and $E^\circ \text{Cu}^{2+}/\text{Cu} = 0.34\text{V}$



This first order reaction was allowed to proceed at 40°C and the data given below:-

[N ₂ O ₅] M	Time
0.400	0.00
0.289	20.0
0.209	40.0
0.151	60.0
0.109	80.0

(a) Calculate the rate constant. Include with your answer.

(b) What will be the concentration of N₂O₅ after 100 minutes?

(c) Calculate the initial rate reaction.

22. What factors are responsible for the stability of complex entities?

23. Write a note on Hardy Schulze rule and Gold number.

24. Explain the following observations:-

(a) The boiling point of ethanol is higher than that of methoxy methine

(b) Phenol is more acidic than ethanol.

(c) a and p nitro phenol are more acidic than phenol

25. How will you account for the following:-

(a) Many of the transition elements and their compounds are **good-catalysts**

(b) The **metallic** radii of the third (5d) series of transition element are virtually the same as those of the second series.

(c) There is a greater range of oxidation states among the **actinoids** than among **lanthanoids**.

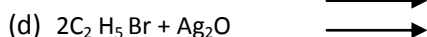
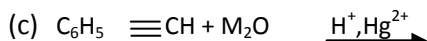
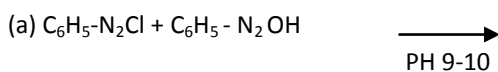
26. Describe the following substance with one example each:-

(a) Non-ionic detergents

(b) Disinfectants

(c) **Tranquilizers**

27. Complete the following reaction equations:-



28. (a) Define the term (i) Mole fraction (2) Van't Hoff factor

(b) 100 mg of a protein is dissolved in enough of water to make 10ml of a solution. If

This solution has an osmotic pressure of 13.3 mm Hg. What is the molar mass of

Protein [R= 0.0821 L atm mol⁻¹K⁻¹ and 760mm Hg=1atm

Or

(a) What is meant by (i) **colligative** properties (ii) **Molality** of solution

(b) Derive an expression for degree of dissociation for weak electrolyte

29. (a) Draw the structure of the following:-

(i) H₂ S₂ O₇ (ii) MClO₃

(b) Explain the following observation:-

(i) In MNO₃ the N-O bond length is shorter than N-OH bond length.

(ii) ICl is more reactive than I₂

Or

(a) Draw the structure of H₂ S₂ O₈ and MClO₄

(b) How would you account the following:-(i) NH₃ is a stronger base than PH₃

(ii) F₂ is a stronger oxidizing agent than Cl₂

(iii) clo₄⁻ is stronger acid than clo⁻

30. (a) Write chemical equation to illustrate the following name reacting:-

(i) **Cannizzaro's reaction** (ii) Hell-Volhard-Zelinsky reaction

(b) Give chemical test to distinguish between following pairs:-

(i) **Propanal** and prop none

(ii) **Acetophenone** and Benzophenone

(iii) Phenol and Benzoic acid

Or

- (a) How will you convert the following conservation:-
- (i) Ethanol to 3-hydroxybutanal
 - (ii) **Benzaldehyde** to Benzophenone
- (b) An organic compound A has the molecular formula $C_8H_{16}O_2$. It gets hydrolyzed with dilute **sulphuric acid** and gives a carboxylic acid B and alcohol C. Oxidation of 'c' with chromic acid also produced 'B'. 'c' on dehydration reaction gives but-1-ene. Write the equations for the reaction involved.

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