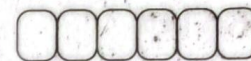


KK12C

Kanniyakumari District  
Common Half Yearly Examination - 2024



Standard 12  
CHEMISTRY

Time: 3.00 Hours

Marks: 70

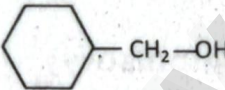




Note: Draw diagrams and write equations wherever necessary.

## PART - I

Note: i) Answer all the questions

15×1=15

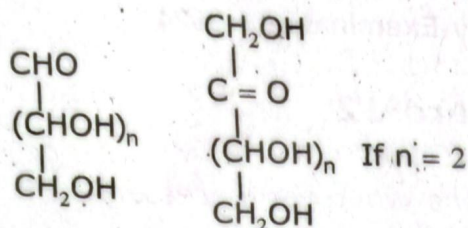
ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

- Which one of the following reaction represents calcination?
  - $2\text{Zn} + \text{O}_2 \rightarrow 2\text{ZnO}$
  - $2\text{ZnS} + \text{O}_2 \rightarrow 2\text{ZnO} + 2\text{SO}_2$
  - $\text{MgCO}_3 \rightarrow \text{MgO} + \text{CO}_2$
  - Both (a) and (c)
- The Catalytic behaviour of transition metals and their compounds is described mainly due to
  - their magnetic behaviour
  - their unfilled
  - orbitals
  - their ability to adopt variable
- How many geometrical Isomers are possible of  $[\text{P}(\text{py})(\text{NH}_3)(\text{Br})(\text{Cl})]$  is
  - 3
  - 4
  - 0
  - 15
- Among the following which one has "T" shaped structure
  - $\text{XeF}_6$
  - $\text{XeOF}_2$
  - $\text{XeOF}_4$
  - $\text{XeO}_3$
- Which is true regarding Nitrogen?
  - least electronegative element
  - has low ionisation enthalpy than oxygen
  - d-orbitals available
  - ability to form  $\text{P}\pi\text{-P}\pi$  bonds with itself.
- Solid  $\text{CO}_2$  is an example of
  - Covalent solid
  - Metallic solid
  - Molecular solid
  - Ionic solid
- What is the pH of  $10^{-7}$  M HCL
  - 6.70
  - 9
  - 7
  - 14
- Which of the following electrolytic solution has the least specific conductance
  - 2N
  - 0.002N
  - 0.02N
  - 0.2N
- The auto catalysis observed in the hydrolysis of ester. The reaction is  $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O} \rightarrow \text{CH}_3\text{COOH} + \text{C}_2\text{H}_5\text{OH}$ 
  - $\text{CH}_3\text{COOC}_2\text{H}_5$
  - $\text{H}_2\text{O}$
  - $\text{C}_2\text{H}_5\text{OH}$
  - $\text{CH}_3\text{COOH}$
-  on treatment with  $\text{con:H}_2\text{SO}_4$  predominately gives
  - 
  - 
  - 
  - 
- Assertion** : 2, 2 dimethyl propanoic acid does not gives HVZ reaction  
**Reason** : 2-2 dimethyl propanoic acid does not have.  $\alpha$  hydrogen atom

  - Both assertion and reason are true and reason is the correct explanation of assertion
  - Both assertion and reason are true and reason is not the correct explanation of assertion
  - Assertion is true but, reason is false
  - Both assertion and reason are false
- The product formed by the reaction an aldehyde with a primary amine
  - Carboxylic acid
  - aromatic acid
  - schiff's base
  - Ketone
- General structure of Aldose and Ketoses are in Carbohydrates are

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The name of Sugar's are

- a) Ribose and Ribulose  
 c) Erythrose and Ribulose  
 b) Erythrose and Erythrulose  
 d) Ribose and Fructose
- 14) The Mechanism proposed for the enzyme catalysis reaction is  
 a)  $P + E \rightarrow E + S \rightleftharpoons ES$   
 b)  $ES \rightleftharpoons P + E \rightarrow E + S$   
 c)  $E + S \rightarrow ES \rightleftharpoons P + E$   
 d)  $E + S \rightleftharpoons ES \rightarrow P + E$
- 15) Match the following
- |  |                         |
|--|-------------------------|
| 1. $\text{Ni}(\text{Co})_4$            | i) Trigonal bipyramidal |
| 2. $[\text{P} + (\text{NH}_3)_4]^{2+}$ | ii) Octahedral          |
| 3. $[\text{Fe}(\text{Co})_5]$          | iii) Tetrahedral        |
| 4. $[\text{Co}(\text{NH}_3)_6]^{2+}$   | iv) Square planar       |
- a) 1-(iii), 2-(iv), 3-(i), 4-(ii)  
 b) 1-(ii), 2-(iii), 3-(iv), 4-(i)  
 c) 1-(iii), 2-(i), 3-(iv), 4-(ii)  
 d) 1-(iv), 2-(i), 3-(ii), 4-(iii)

### PART - II

Answer any 6 of the following questions. (Q.No. 21 is compulsory)  $6 \times 2 = 12$

- 16) Write the preparation of Borazole  
 17) What are interstitial compounds?  
 18) Indicate the possible type of Isomerism for the following complexes.  
 a)  $[\text{Co}(\text{en})_3]^{3+}$       b)  $[\text{P}(\text{NH}_3)_2\text{Cl}_2]^{2+}$   
 19) If the number of close packed sphere is 6. Calculate the number of octahedral and tetra hedral voids generated  
 20) Give two examples of Zero order reaction  
 21) Copper electrode is dipped in 0.1 M copper Sulphate solution at 25°C. Calculate the electrode potential of copper (Given  $E^\circ_{\text{Cu}^{2+}/\text{Cu}} = 0.34 \text{ v}$ )  
 22) How is Nylon 6-prepared  
 23) Why aniline does not undergo Friedel-Craft's reaction  
 24) Give two industrial uses of formaldehyde

### PART - III

Answer any 6 of the following questions. (Q.No. 33 is compulsory)  $6 \times 3 = 18$

- 25) Write note about catenation.  
 26) Draw the structures of the following compounds  
 a) Marshall's acid    b) Hypophosphoric acid    c) Nitric acid  
 27) Write Arrhenius equation and explain the terms involved  
 28) Give three uses of Silicones  
 29) In case of chemisorption, why adsorption first increases and then decreases with temperature? Draw the Graph also  
 30) Derive Henderson - Hasselbalch equation  
 31) Explain a) Riemeier - Tiemann reaction  
       b) Trans. Esterification reaction  
 32) Why Formic acid reduces Fehlings solution?  
 33) Arrange the following in the order of their increasing  
 i) Solubility in  $\text{H}_2\text{O}$  -  $\text{C}_6\text{H}_5\text{NH}_2$ ,  $(\text{C}_6\text{H}_5)_2\text{NH}$ ,  $\text{C}_2\text{H}_5\text{NH}_2$   
 ii) Basic strength -  $\text{C}_6\text{H}_5\text{NH}_2$ ,  $\text{C}_6\text{H}_5\text{N}(\text{CH}_3)_2$ ,  $(\text{C}_2\text{H}_5)_2\text{NH}$  and  $\text{CH}_3\text{NH}_2$   
 iii) Reactivity -  $\text{CH}_3\text{COOCH}_3$ ,  $\text{CH}_3\text{CONH}_2$ ,  $\text{CH}_3\text{COCl}$  and  $(\text{CH}_3\text{CO})_2\text{O}$

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## PART - IV

Answer all questions.

5×5=25

- 34) a) Why HF is stored in wax bottles and not in glass bottles (3m)  
 b) Complete the following  
 i)  $\text{Fe}_2\text{O}_3 + \text{CO} \rightarrow$   
 ii)  $\text{P}_4 + \text{NaOH} + \text{H}_2\text{O} \rightarrow$  (2m)  
 (OR)
- c) Explain magnetic separation method (3m)  
 d) Out of  $\text{Lu}(\text{OH})_3$  and  $\text{La}(\text{OH})_3$  which is more basic and why? (2m)
- 35) a) Explain main assumption of valence bond theory (5m)  
 (OR)  
 b) Differentiate Crystalline solid and amorphous solid (5m)
- 36) a) Write any three methods of preparation of Colloids by chemical method (3m)  
 b) Write the steps involved in a heterogenous Catalysed reaction (2)  
 (OR)  
 c) Explain  $\text{H}_2 - \text{O}_2$  fuel cell (3m)  
 d) Differentiate order and molecularity (2)
- 37) How to prepare the following from phenylmethanal  
 a) Benzoin    b) Malachitegreen dye    c) Cinnamic acid (5m)  
 (OR)  
 d) During the structural elucidation of fructose how to prove the following facts  
 i) That the six carbon atom in a stright line  
 ii) Presence of five (-OH) groups  
 iii) Confirms the presence of Keto group (3m)  
 e) Give any two tests to differentiate phenol and alcohol (2m)
- 38) a) How will you distinguish between primary, secondary and tertiary aliphatic amines (5m)  
 (OR)  
 b) An alkene (A) on Ozonolysis gives propan one and aldehyde (B). When (B) is Oxidised (C) is obtained. (C) is treated with  $\text{Br}_2/\text{P}$  give [D]. Which on hydrolysis gives (E). When propanone is treated with HCN followed by hydrolysis gives [E]. Identify A, B, C, D, E and Explain reactions. (5m)
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