

INORGANIC CHEMISTRY

FULL SYLLABUS

TIME :30 Min

**SECTION-I : (i) Only One option correct Type**

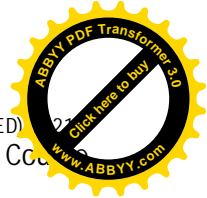
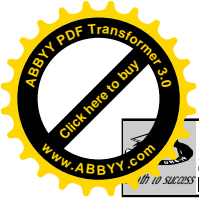
This section contains **05 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct. **3(-1)**

- With reference to *aqua regia*,  
Statement-1 :- Reaction of gold with *aqua regia* produces  $\text{NO}_2$  in the absence of air  
Statement-2 :- *Aqua regia* is prepared by mixing conc.  $\text{HCl}$  and conc.  $\text{HNO}_3$  in 3 : 1 (v/v) ratio  
Statement-3 :- Reaction of gold with *aqua regia* produces an anion having Au in +3 oxidation state  
Statement-4 :- The yellow colour of *aqua regia* is due to the presence of  $\text{NOCl}$  and  $\text{Cl}_2$   
choose the **CORRECT** option for the above statements..  
(A) F T F T (B) F T T T (C) T F T T (D) T F F T
- $\text{CO}_3^{2-}$  and  $\text{S}_2\text{O}_3^{2-}$  can be distinguished by  
(A)  $\text{CuSO}_4$  solution (B)  $\text{BaCl}_2$  solution (C)  $\text{Pb}(\text{OAc})_2$  solution (D) All of these
- The correct order of mobility of  $\text{M}^+$  ions of alkali metal in aqueous solution is-  
(A)  $\text{Li}^+ < \text{Na}^+ < \text{Rb}^+ < \text{Cs}^+ < \text{K}^+$  (B)  $\text{Na}^+ < \text{K}^+ < \text{Li}^+ < \text{Rb}^+ < \text{Cs}^+$   
(C)  $\text{Cs}^+ > \text{Rb}^+ > \text{K}^+ > \text{Na}^+ > \text{Li}^+$  (D)  $\text{Li}^+ > \text{Na}^+ > \text{K}^+ > \text{Rb}^+ > \text{Cs}^+$
- Which of the following statement is correct -  
(A)  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ions do not form complex with EDTA  
(B)  $\text{Be}(\text{OH})_2$  is acidic in nature  
(C)  $\text{Na}_2\text{O}_2$  is an oxidising agent and it oxidises charcoal,  $\text{CO}$ ,  $\text{NH}_3$ ,  $\text{SO}_2$  etc.  
(D) On heating white colour of  $\text{K}_2\text{O}$  become changed into black.
- Which of the following reaction does not occur in the conversion of  $\text{ZnS}$  to  $\text{Zn}$  -  
(A)  $\text{ZnS} + 2\text{O}_2 \xrightarrow{\Delta} \text{ZnSO}_4$  (B)  $\text{ZnS} + 3/2 \text{O}_2 \xrightarrow{\Delta} \text{ZnO} + \text{SO}_2$   
(C)  $2\text{ZnO} + \text{ZnS} \xrightarrow{\Delta} 3\text{Zn} + \text{SO}_2$  (D)  $\text{ZnO} + \text{C} \xrightarrow{\Delta} \text{Zn} + \text{CO}$

**(ii) One or more options correct Type**

This section contains **05 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONE or MORE** are correct. **4(-1)**

- Which of the following statement(s) is/are correct -  
(A) Froth floatation method can be used for sulphide ore  
(B) Tin stone consist of wolframite as magnetic impurity  
(C) In cyanide process for the extraction of silver,  $\text{Zn}$  used as reducing agent  
(D) Bessemerization process is involved in the extraction of copper from copper pyrite
- What are the following step(s) is/are to be done before adding group-III reagent into the group-II filtrate.  
(A) Group-II filtrate is to be evaporated to dryness  
(B) Group-II filtrate is to be boiled of first  
(C) After boiling 2-3 drops of  $\text{dil. H}_2\text{SO}_4$  is added and boiled again.  
(D) After boiling 2-3 drops of  $\text{conc. HNO}_3$  is added and boiled again.
- $[\text{Fe}(\text{H}_2\text{O})_5\text{NO}]^{2+}$  is unstable because -  
(A) It is brown colored  
(B) It liberates  $\text{NO}_2$  gas on shaking  
(C) The charge of central atom is +1 (relatively low enough)  
(D) Coordination Number of central metal is six



9. Out of given three complexes  
(I)  $[\text{Mn}(\text{CO})_6]^+$  (II)  $[\text{Cr}(\text{CO})_6]$  (III)  $[\text{V}(\text{CO})_6]^-$   
Identify the correct statement(s).  
(A) (III) has maximum C-O length  
(B) (II) has lowest O.N. of metal  
(C) (I) has minimum number of electrons  
(D) (III) has maximum  $\pi$ -character in metal-carbon bond
10. Which of the following pair of species in their aqueous solution can not exist simultaneously in one container ?  
(A)  $(\text{Ti}^{3+}_{(\text{aq.})} + \text{KI})$  (B)  $(\text{CsI}_3 + \text{KI}_3)$  (C)  $(\text{Ti}^+\text{I}_3^- + \text{KI}_3)$  (D)  $(\text{SnCl}_2 + \text{HgCl}_2)$

**(iii) Paragraph Type**

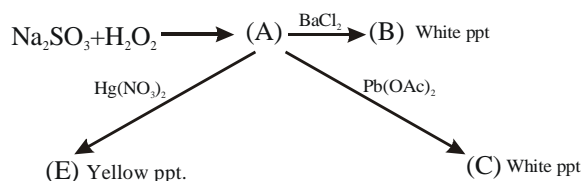
This section contains **02 paragraphs** each describing theory, experiment, data etc. Each question of a paragraph has **only one correct answer** among the four choices (A), (B), (C) and (D). **3(-1)**

**Paragraph for Q.11 to Q.13**

The hardness of natural water is generally caused by presence of bicarbonates, chlorides and sulphates of calcium and magnesium but infact soluble salts that form a scum with soap cause hardness. Hardness of water is two types : (1) temporary hardness. (2) permanent hardness.

11. Temporary hardness is caused due to the presence of -  
(A)  $\text{CO}_3^{2-}$  (B)  $\text{SO}_4^{2-}$  (C)  $\text{PO}_4^{3-}$  (D) None
12. In ion exchange resin method, cations which are responsible for hardness is removed, now the obtained water is not fit for the drinking purpose due to the presence of -  
(A) Acidic nature (B) Basic nature  
(C)  $\text{Ca}^{+2} / \text{Mg}^{2+}$  ion (D) dissolve resin
13. Permanent hardness is removed by -  
(A) Boiling (B) NaCl (C)  $\text{CaCl}_2$  (D)  $\text{Na}_2\text{CO}_3$

**Paragraph for Q. 14 to Q. 16**



14. Identify A-  
(A)  $\text{Na}_2\text{S}_2\text{O}_3$  (B)  $\text{Na}_2\text{SO}_4$  (C)  $\text{Na}_2\text{S}$  (D) None of these
15. What is the formula of yellow ppt. (E)-  
(A)  $\text{HgSO}_4$  (B)  $2\text{HgSO}_4 \cdot \text{HgO}$  (C)  $2\text{HgO} \cdot \text{HgSO}_4$  (D) None of these
16. What is the shape of Anionic part of (C)  
(A) Trigonal planar (B) Tetrahedral (C) TBP (D) Square planar

(iv) Matching List Type

This Section contains **3 multiple choice questions**. Each question has **matching lists**. The codes for the lists, have choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct. **4(0)**

Column-I Reactant-A	Column-II Reactant-B (in aq. solution)	Column-III Reactant-C (Characteristic of Reaction)
(I) $\text{PH}_3$	(i) $\text{Cl}_2$	(P) Disproportion
(II) $\text{NH}_3$	(ii) $\text{CaOCl}_2$	(Q) Precipitate is formed
(III) $\text{SO}_3^{2-}$ (excess)	(iii) $\text{CaCl}_2$	(R) Adduct/complex is formed
(IV) $\text{NaOH}$	(iv) $\text{AgNO}_3$	(S) Redox reaction

17. Which of the following is **CORRECT** combination for  $\text{PH}_3$ .  
 (A) (I), (i), (Q) (B) (I), (ii), (S) (C) (I), (iii), (P) (D) (I), (iv), (R)
18. Which of the following combination is **INCORRECT**?  
 (A) (II), (i), (S) (B) (II), (iv), (Q)  
 (C) (III), (iv), (Q) (D) (III), (i), (S)
19. Which of the following is correct combination for  $\text{NaOH}$ .  
 (A) (IV), (i), (P)(S) (B) (IV), (ii), (Q) (C) (IV), (iii), (S) (D) (IV), (iv), (S)

**SECTION-II : Matrix-Match Type**

This Section contains **01 question**. Question has **four statements** (A, B, C and D) given in **Column I** and five statements (P, Q, R, S and T) in **Column II**. Any given statement in Column I can have correct matching with **ONE** or **MORE** statement(s) given in Column II. For example, if for a given question, statement B matches with the statements given in Q and R, then for the particular question, against statement B, darken the bubbles corresponding to Q and R in the ORS. **8(0)**

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| <p>1. <b>Column-I</b><br/>(Complex compound)</p> <p>(A) <math>[\text{CoCl}_2\text{Br}_2]^{-2}</math><br/>             (B) <math>[\text{Rh}(\text{en})_3]^{3+}</math><br/>             (C) <math>[\text{Cr}(\text{en})_2\text{Br}_2]^+</math><br/>             (D) <math>[\text{Pt}(\text{gly})\text{ClBr}]^{-1}</math></p> | <p><b>Column-II</b><br/>(Characteristics)</p> <p>(P) Does not show geometrical isomerism<br/>             (Q) Does not show optical isomerism<br/>             (R) Having two optically active form<br/>             (S) Chelating complex<br/>             (T) Metal is in +2 oxidation state</p> |
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