21.02.2024

Time: 3.00 Hours

Standard 12
CHEMISTRY
Part - A

Marks: 70

Answer all the questions.

15x1=15

1) Wolframite ore is separated from tinstone by the process of
   a) melting
   b) Calcination
   c) Roasting
   d) Electromagnetic separation

2) The stability of +1 oxidation state increases in the sequence
   a) Al < Ga < In < Tl
   b) Tl < In< Ga < Al
   c) In < Tl < Ga < Al
   d) Ga < In < Al < Tl

3) Among H_2O, H_2S, H_2Te, H_2Se, the one with maximum boiling point is.
   a) H_2O because of hydrogen bonding
   b) H_2Te because of higher molecular mass
   c) H_2S because of hydrogen bonding
   d) H_2Se because of lower molecular mass

4) Which one of the following is more basic in nature?
   a) $La(OH)_3$
   b) $Ce(OH)_3$
   c) $Gd(OH)_3$
   d) $Lu(OH)_3$

5) Among the following complexes which one shows zero CFSE?
   a) $[Mn(H_2O)_6]^{3+}$
   b) $[Fe(H_2O)_6]^{3+}$
   c) $[Co(H_2O)_6]^{2+}$
   d) $[CO(H_2O)_6]^{3+}$

6) Iodine molecules are held in the crystal lattice by
   a) London forces
   b) dipole - dipole interaction
   c) covalent bonds
   d) columbic forces

7) For a general reaction aA + bB → Products, the rate of the reaction is equal to ....
   a) $k[A]^a[B]^b$
   b) k[A][B]
   c) k
   d) –

8) **Assertion :** K_a is called the ionisation constant or dissociation constant of the acid

   Reason : It measures the strength of an acid
   a) Both assertion and reason are true and the reason is the correct explanation of the assertion
   b) Both assertion and reason are true but the reason is not the correct explanation of the assertion
   c) Assertion is true but reason is false
   d) Both assertion and reason are false statements.

9) **Assertion (A) :** Copper Sulphate can be stored in a Zinc vessel
   Reason (R) : Zinc is less reactive than Copper
   a) Both A and R are correct and R is the correct explanation of A
   b) Both A and R are wrong
   c) A is correct but R is not the correct explanation of A
   d) A is wrong but R is correct

10) Find the odd one out
   a) Smoke
   b) Froth
   c) Fumes
   d) Dust
   e) Air pollutants

11) Which one of the following is called Lucas reagent?
   a) Conc.HCl + Anhydrous $ZnCl_2$
   b) Conc.HCl + Anhydrous $AlCl_3$
   c) $LiAlH_4$ + H_2O
   d) Cold dilute alkaline $KMnO_4$

12) The acid which reduces Tollens reagent is
   a) HCOOH
   b) CH_3COOH
   c) C_6H_5COOH
   d) C_2H_5COOH

13) Nitrobenzene on electrolytic reduction in con. Sulphuric acid, the intermediate formed is
   a) $C_6H_5NH-NHC_6H_5$
   b) $C_6H_5-N=N-C_6H_5$
   c) C_6H_5-NHOH
   d) $C_6H_5 HSO_4$

14) Sucrose is converted into glucose and fructose by the enzyme
   a) Zymase
   b) invertase
   c) lactase
   d) fructase

15) Which among the following is used as an emulsifier?
   a) Sodium meta bisulphite
   b) Alkyl ester of hydroxy benzoic acid
   c) Sucrose ester with palmitic acid
   d) All the above.

Part - B

Answer any 6 questions. Q.No. 21 is compulsory.   6x2=12

16) Define roasting.
17) Why is Ce^{4+} in aqueous solution is a good oxidizing agent?
18) Write a short notes on metallic crystals?
19) Define average rate and instantaneous rate
20) If $Ba[OH]_2$ is a strong electrolyte, what is the pH of 0.02M $Ba(OH)_2$?
21) Calculate the molar conductance of 0.01M aqueous KCl solution at 25°C. The specific conductance of KCl at 25°C is 14.114×10^{-2} Sm^{-1}.
22) Starting from phenol how would you obtain the following compound? Anisole
23) Identify A and B
   A $CH_3-CH2-NH_2$
   B $CH_3-NH-CH_3$
24) Define the term Agonists

Part - C

Answer any 6 questions. Q.No. 28 is compulsory.   6x3=18

25) How will you convert boric acid to boron nitride?
26) Mention the properties of interstitial compounds
27) Predict the number of unpaired electrons in $[CoCl_4]^{2-}$. ion on the basis of VBT.
28) The concentration of hydrogen ions in a sample of soft drink is 3.8×10^{-3} m. Whatis the pH value? Whether the soft drink is acidic (or) basic?
29) State Ohm's law.
30) What are the factors influences Active centres that can be explained by adsorption theory?
31) Write note on crossed aldolcondensation.
32) Give the structure of a zwitter ion.
33) Write a note on total fattymatter (TFM) of soap
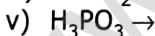
Part - D

Answer all the questions.   5x5=25
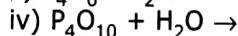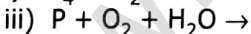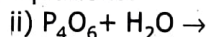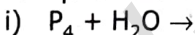
34) a) i)   Write short note on magnetic seperation method.
       ii) What are the limitations of Elliingham diagram
                          (OR)
    b) i)   Write any two conditions for catenation.
       ii) Why HF cannot be stored in glass bottles?
35) a) Complete and balance the following equations.
       i) $P_4 + H_2O \rightarrow$ ii) $P_4O_6 + H_2O \rightarrow$
       iii) $P + O_2 + H_2O \rightarrow$ iv) $P_4O_{10} + H_2O \rightarrow$
       v) $H_3PO_3 \rightarrow$
                          (OR)
    b) Differentiate Lanthanoids. And actinoids
36) a) i)   Explain Frenkal defect with examples
       ii) Write any three difference between order and molecularity
                          (OR)
    b) i)   Derive the equation of Ostwald's dilution law
       ii) What is peptisation?
37) a) Derive Nernst Equation
                          (OR)
    b) i)   Explain Kolbe's reaction
       ii) Convert Glycerol to glycerose
38) a) i)   Explain the mechanism of Esterification reaction.
       ii) What is HVZ reaction
                          (OR)
    b) i)   Write note on carbylamines reaction
       ii) How is tecron prepared.

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