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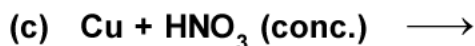
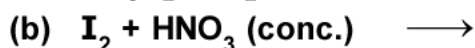
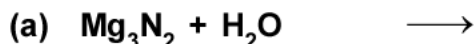
Time : 6 hr

Total Marks = 95

Date: 23/10/2017

- Q1. Write the balanced equations for the following:** **3**
- (a) Chlorine gas is passed into a solution of NaI in water.
(b) SiO_2 is treated with HF.
(c) Iodine is treated with conc. HNO_3 .
- Q2. (a) Give Hybridization of P and shape of Red Phosphorous.** **3**
(b) Give Hybridization of P in P_4 and give shape of P_4 (White phosphorous)
- Q3. Arrange the following according to given trend** **3**
- (a) H_2Se , H_2Te , H_2O , H_2S thermal stability of hydrides
(b) H_2Se , H_2Te , H_2O , H_2S bond angle
(c) Br^\ominus , I^\ominus , F^\ominus , Cl^\ominus enthalpy of hydration of X^\ominus ion
- Q4. Arrange the following according to given trend** **3**
- (a) M – Br, M – I, M – F, M – Cl ionic character of M – X bond
(b) Cl_2O_7 , Cl_2O_6 , Cl_2O , ClO_2 oxidising power of oxides
(c) ClO^\ominus , ClO_4^\ominus , ClO_2^\ominus , ClO_3^\ominus basic strength of conjugate base
- Q5. Arrange the following according to given trend** **3**
- (a) H_2SO_4 , H_2SO_3 , H_2SO_5 , $\text{H}_2\text{S}_2\text{O}_3$ decreasing acidic character.
(b) HClO , HClO_2 , HClO_3 , HClO_4 decreasing acidic character
(c) NH_3 , PH_3 , AsH_3 , SbH_3 , BiH_3 decreasing basic character.
- Q6. Write the structure of** **3**
- (a) $\text{P}^2 - \text{P}^2$ acid (b) $\text{P}^2 - \text{P}^4$ acid (c) $\text{P}^4 - \text{P}^4$ acid
- Q7. Give the formula of the noble gas species which is isostructural with** **3**
- (a) IBr_2^\ominus (b) ICl_4^\ominus (c) BrO_3^\ominus
- Q8. Which aerosols deplete ozone?** **3**
- Q9. Justify the placement of O, S, Se, Te and Po in the same group of the periodic table in terms of electronic configuration, oxidation, state and hydride formation.** **3**
- Q10. Complete the reactions :** **3**
- (a) $\text{NH}_4\text{NO}_3 (\text{s}) \xrightarrow{\text{Heat}}$
(b) $\text{N}_2\text{O} + \text{NaNH}_2 \longrightarrow$
(c) $\text{CuO} + \text{NH}_3 \longrightarrow$
- Q11. How are xenon fluorides XeF_2 , XeF_4 and XeF_6 obtained?** **3**

Q12. Write the products of the following reactions (give balanced chemical equations) : **3**



Q13. Knowing the electron gain enthalpy values for $\text{O} \rightarrow \text{O}^\ominus$ and $\text{O} \rightarrow \text{O}_2$ as -141 and 702 kJ mol^{-1} respectively, how can you account for the formation of a large number of oxides having $\text{O}^{2\ominus}$ species and not O^\ominus ? **3**

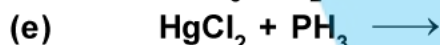
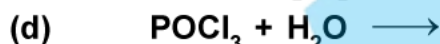
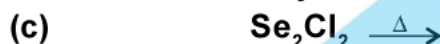
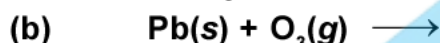
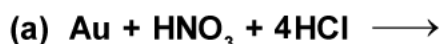
Q14. Explain the Industrial preparation of ammonia (Haber's process). **3**

Q15. Explain Ostwald's process to prepare HNO_3 . **3**

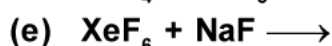
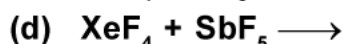
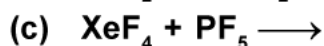
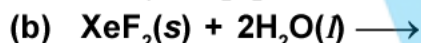
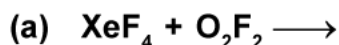
Q16. Arrange the following according to given trend: **5**

- (a) HCl , HBr , HI , HF thermal stability (b) HCl , HF , HI , HBr acidic strength
(c) F^\ominus , I^\ominus , Br^\ominus , Cl^\ominus conjugate base strength (d) HF , HBr , HI , HCl reducing property
(e) HBr , HI , HF , HCl dipole moment

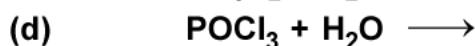
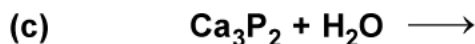
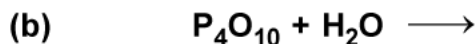
Q17. Write balanced equations for the following reactions: **5**



Q18. Complete and balance the following reactions: **5**



Q19. Write balanced equations for the following reaction : **5**



Q20. Describe the manufacture of H_2SO_4 by contact process. **5**

Q21. Comment the following: **5**

(a) NO_2 readily forms a dimer, explain.

(b) H_3PO_3 is diprotic, explain.

(c) How do you account for the reducing behaviour of H_3PO_2 on the basis of its structure?

- Q22. (a) Write the chemical equations involved in the preparation of the following:** **5**
(i) XeF_4 (ii) H_3PO_3
- (b) Account for the following:**
(i) Thermal stability of water is much higher than that of H_2S .
(ii) White phosphorous is more reactive than red phosphorus.
- (c) Draw the structure of XeOF_4 .**
- Q23. Account the following** **5**
- (a) Give equation to Lab. preparation of dioxygen.
(b) Give equation to Lab preparation of PH_3 .
(c) Name two compounds in which oxygen has oxidation state different from -2 . Given oxidation state also.
(d) Oxygen molecule has formula O_2 whilst sulphur is S_8 . Explain why?
(e) SF_6 is known but SH_6 is not known.
- Q24. Account the following:** **5**
- (a) Give reason SF_6 is not easily hydrolysed though thermodynamically it should be, why?
(b) The bond energy of F_2 is less than Cl_2 , explain.
(c) Draw the structure of XeO_3 .
(d) Complete the reaction $\text{XeF}_6 + \text{KF} \longrightarrow$
(e) Arrange the following decreasing boiling point H_2O , H_2S , H_2Se and H_2Te .
- Q25. Account the following** **5**
- (a) Xenon show Fluorides but Xenon chloride not known, explain.
(b) How are XeF_2 and XeF_4 prepared.
(c) Give shape and hybridization of XeOF_2 and XeO_2F_2 .