Basic Exercise

1. Red and yellow phosphorus are :

(1) Allotropes (2) Isobars (3) Isomers (4) Isotopes

Ans. **(1)**

2. Phosphorus is kept in :

(1) Kerosene oil (2) Alcohol (3) Water (4) Ammonia

Ans. **(3)**

Nitrogen Family

3. Nitrogen reacts with calcium carbide to give -

(1) Calcium nitride (2) Calcium cyanide (3) Calcium cyanamide (4) Calcium nitrate

Ans. **(3)**

4. Which is less hydrolysied :

(1) PCl_3 (2) NCl_3 (3) $AsCl_3$ (4) $SbCl_3$

Ans. **(4)**

5. P_2O_5 is used extensively as a :

(1) Dehydrating agent (2) Catalytic agent (3) Reducing agent (4) Preservative

Ans. **(1)**

6. PH_3 produces smoky rings when it comes in contact with air. This is because :

(1) It is inflamable (2) It combines with water vapours

(3) It combines with nitrogen (4) It contains impurity of P_2H_4

Ans. **(4)**

7. Which of the following is the correct statement for PH_3

(1) It is less basic than NH_3 (2) It is less poisonous than NH_3

(3) Bond angle of $PH_3 > NH_3$ (4) It does not show reducing properties

Ans. **(1)**

8. Ammonia reacts with excess of chlorine to form :

(1) N_2 and NH_4Cl (2) NCl_3 and HCl (3) NH_4Cl and NCl_3 (4) N_2 and HCl

Ans. **(2)**

9. Concentrated nitric acid reacts with iodine to give:-

(1) HI (2) HOI (3) $HOIO_2$ (4) $HOIO_3$

Ans. **(3)**

10. Each of the following is true of white and red phosphorus except that they

(1) Are both soluble in CS_2 (2) Can be oxidised by heating in air

(3) Consist of the same kind of atoms (4) Can be converted into one another

Ans. **(1)**

11. A gas which is used as anaesthetic in dental surgery is :

(1) N_2 (2) CO (3) N_2O (4) NH_3

Ans. **(3)**

12. The wrong statement about NH_3 is :

(1) It is oxidised with oxygen at 700°C in the presence of platinum

(2) It gives black precipitate with calomel (Hg_2Cl_2)

(3) It can be dried by P_2O_5, H_2SO_4 and $CaCl_2$

(4) It gives white fumes with HCl

Ans. **(3)**

13. Which one of the following acid possesses oxidising, reducing and complex forming properties ?

(1) HNO_3 (2) HCl (3) H_2SO_4 (4) HNO_2

Ans. **(4)**

14. NO_2 is formed when

(1) Cu reacts with conc. HNO_3 (2) Zn reacts with conc. HNO_3

(3) $Pb(NO_3)_2$ is heated (4) All

Ans. **(4)**

15. Which of the following does not produce NO_2 gas with conc. HNO_3 ?

(1) Cu (2) I_2 (3) Ag (4) Au

Ans. **(4)**

Oxygen Family

16. SO_2 can acts as -

(1) Reducing agent (2) Oxidising agent (3) Bleaching agent (4) All

Ans. **(4)**

17. Which amongst the following reactions cannot be used for the preparation of the halogen acid ?

(1) $2KBr + H_2SO_4(Conc.) \longrightarrow K_2SO_4 + 2HBr$

(2) $2NaCl + H_2SO_4(Conc.) \longrightarrow NaHSO_4 + HCl$

(3) $NaHSO_4 + NaCl \longrightarrow Na_2SO_4 + HCl$

(4) $CaF_2 + H_2SO_4(conc.) \longrightarrow CaSO_4 + 2HF$

Ans. **(1)**

18. Ozone acts as

(1) Oxidising agent (2) Reducing agent (3) Bleaching agent (4) All

Ans. **(4)**

19. A black sulphide when treated with ozone becomes white. The white compound is :

(1) $ZnSO_4$ (2) $CaSO_4$ (3) $BaSO_4$ (4) $PbSO_4$

Ans. **(4)**

20. H_2S gas changes a filter paper dipped in lead acetate solution into :

(1) Black (2) Red (3) Green (4) Yellow

Ans. **(1)**

21. The number of S–S bonds in sulphur trioxide trimer (S_3O_9) is :

(1) Three (2) Two (3) One (4) Zero

Ans. **(4)**

22. Dry bleaching is done by :

(1) Cl_2 (2) SO_2 (3) O_3 (4) None

Ans. **(3)**

23. When KBr is treated with conc. H_2SO_4 reddish brown gas is evolved. The gas is :

(1) Br_2 (2) Br_2 +HBr (3) NO_2 (4) H_2O_2

Ans. **(1)**

24. One gas bleaches the colour of the flowers by reduction while the other by oxidation. The gases are :

(1) CO and CO_2 (2) H_2S and Br_2 (3) SO_2 and Cl_2 (4) NH_3 and SO_3

Ans. **(3)**

25. On addition of conc. H_2SO_4 to a chloride salt, colourless fumes are evolved but in case of iodide salt, violet fumes come out. This is because :-

(1) H_2SO_4 reduces HI to I_2 (2) HI is of violet colour

(3) HI gets oxidised to I_2 (4) HI changes to HIO_3

Ans. **(3)**

26. Which of the following is responsible for turning starch-iodide paper blue when it is brought in contact with O_3 ?

(1) Liberation of iodine (2) Liberation of oxygen

(3) Formation of alkali (4) Reaction of ozone with litmus paper

Ans. **(1)**

27. Which one of the following property is not correct for ozone ?

(1) It oxidises lead sulphide (2) It oxidises potassium iodide

(3) It oxidises mercury (4) It cannot act as bleaching agent in dry state

Ans. **(4)**

28. By which of the following SO_2 is formed ?

(1) Reaction of dilute H_2SO_4 with O_2

(2) Heating $Fe_2(SO_4)_3$

(3) Reaction of concentrated H_2SO_4 with Cu

(4) None

Ans. **(3)**

Halogen Family & Inert Gas

29. Select the correct statement(s) from the following -

(1) Fluorine displaces other halogens from the corresponding halides

(2) Fluorine reacts slowly with halogens

(3) Fluorine does not decompose water

(4) Except fluorine, other halogens directly combine with carbon

Ans. **(1)**

30. Which one of the following oxy acid of fluorine exists ?

(1) HOF (2) HFO_3 (3) HFO_4 (4) HFO_2

Ans. **(1)**

31. Which of the following statements is correct ?

(1) All form $HOXO_3$ type oxy acid (2) Only chlorine and bromine form oxyacids

(3) All halogens form oxyacids (4) Only iodine forms oxyacid

Ans. **(3)**

32. Which of the following is a false statement ?

(1) Halogens are strong oxidising agent

(2) Halogne show only –1 oxidation state

(3) HF molecules from intermolecular hydrogne bonding

(4) Fluorine is highly reactive

Ans. **(2)**

33. The halide which does not give a precipitate with $AgNO_3$ is -

(1) F^- (2) Cl^- (3) Br^- (4) I^-

Ans. **(1)**

34. Volatile nature of halogen is because :

(1) Halogen molecules are bonded by strong forces

(2) Halogen molecules are bonded by electrostatic forces

(3) The forces existing between the discrete molecule are only weak vander Waals force.

(4) Halogen molecules are more reactive

Ans. **(3)**

35. Iodine gas turns starch iodide paper :

(1) Blue (2) Red (3) Colourless (4) Yellow

Ans. **(1)**

36. BrF_5 is a :

(1) Interhalogen compound (2) Pseudohalogen compound

(3) Both the above (4) None of the above

Ans. **(1)**

37. Chlorine is liberated when we heat :

(1) $KMnO_4 + NaCl$ (2) $K_2Cr_2O_7 + MnO_2$ (3) $Pb(NO_3)_2 + MnO_2$ (4) $K_2Cr_2O_7 + CuCl$

Ans. **(1)**

38. Which one of the following halogen liberates oxygen on reacting with H_2O

(1) I_2 (2) Cl_2 (3) Br_2 (4) F_2

Ans. **(4)**

39. Which of the following gases can be dried by concentrated H_2SO_4 ?

(1) HCl (2) HBr (3) HI (4) H_2S

Ans. **(1)**

40. Helium is added to oxygen used by deep sea divers because :

(1) It is less soluble in blood than nitrogen under high pressure

(2) It is lighter than nitrogen

(3) It is readily miscible with oxygen

(4) It is less poisonous than nitrogen

Ans. **(1)**

41. Which of the following is not correct :

(1) XeO_3 has four σ and four π bonds

(2) The hybridization of Xe in XeF_4 is sp^3d^2

(3) Among noble gases, the occurrence of argon is highest in air

(4) Liquid helium is used as cryogenic liquid

Ans. **(1)**

42. XeF_2 reacts with SbF_5 to form :

(1) $[XeF]^+ [SbF_6]^-$ (2) $[XeF_3]^- [SbF_4]^-$ (3) $Xe^- [PtF_6]^+$ (4) XeF_4

Ans. **(1)**

43. Which factor is most responsible for the increase in boiling points of noble gases from He to Xe ?

(1) decrease in I.E (2) Monoatomic nature

(3) decrease in polarisability (4) increase in polarisability

Ans. **(4)**

44. The compound that cannot be formed by xenon is

(1) XeO_3 (2) XeF_4 (3) $XeCl_4$ (4) XeO_2F_2

Ans. **(3)**

45. XeF_6 dissolves in anhydrous HF to give a good conducting solution which contains

(1) H^+ and XeF_7^- ion (2) HF_2^- and XeF_5^+ ions (3) $HXeF_6^+$ and F^- ions (4) none of these

Ans. **(1)**

46. SbF_5 reacts with XeF_4 to form an adduct. The shapes of cation and anion in the adduct are respectively

(1) square planar, trigonal bipyramidal (2) T-shaped, octahedral

(3) square pyramidal, octahedral (4) square planar, octahedral

Ans. **(2)**

47. Which of the following noble gas does not form clathrate compound ?

(1) Kr (2) Ne (3) Xe (4) Ar

Ans. **(2)**

Analytical Exercise

1. One mole of magnesium nitride on the reaction with an excess of water gives

(1) Two moles of ammonia (2) One mole of nitric acid

(3) One mole of ammonia (4) Two moles of nitric acid

Ans. **(1)**

2. Which of the following oxides of nitrogen is solid :-

(1) NO_2 (2) N_2O (3) N_2O_3 (4) N_2O_5

Ans. **(4)**

3. Which has no S-S bond.

(1) $S_2O_4^{2-}$ (2) $S_2O_5^{-2}$ (3) $S_2O_3^{-2}$ (4) $S_2O_7^{-2}$

Ans. **(4)**

4. Which of the following on thermal-decomposition yields a basic as well as an acidic oxide ?

(1) NH_4NO_3 (2) $NaNO_3$ (3) $KClO_3$ (4) $CaCO_3$

Ans. **(4)**

5. Which of the following statement is wrong ?

(1) Single N–N bond is weaker than the single P–P bond

(2) N_2O_4 has two resonance structures

(3) The stability of hydrides increases from NH_3 to BiH_3 in group 15 of the periodic table

(4) Nitrogen cannot form $d\pi$-$p\pi$ bond

Ans. **(3)**

6. Which one of the following reacts with glass ?

(1) H_2SO_4 (2) HF (3) HNO_3 (4) $K_2Cr_2O_7$

Ans. **(2)**

7. When I_2 is passed through KCl, KF, KBr sulutions :

(1) Cl_2 and Br_2 are evolved (2) Cl_2 is evolved

(3) Cl_2, Br_2, F_2 are evolved (4) None of these

Ans. **(4)**

8. Ammonia can be dried by

(1) Conc.H_2SO_4 (2) P_4O_{10} (3) CaO (4) Anhydrous $CaCl_2$

Ans. **(3)**

9. Which of the following product is not formed by the reaction of PH_4 I and KOH :-

(1) KI (2) PH_3 (3) H_2O (4) P_2O_3

Ans. **(4)**

10. Out of the following which does not liberate N_2 gas on heating :-

(1) $NaNO_2 + NH_4Cl$ (2) $Ba(N_3)_2$ (3) $O_3 + NO$ (4) $(NH_4)_2\,Cr_2O_7$

Ans. **(3)**

11. Hypo is used in photography because of it

(1) Reducing behaviour (2) Oxidising behaviour

(3) Complex forming behaviour (4) Reaction with light

Ans. **(3)**

12. Which of the following is incorrect ?

(1) O_2 is weaker oxidant than O_3 (2) O_2 has small bond length than O_3

(3) Both O_2 and O_3 are paramagnetic (4) O_3 is angular in shape

Ans. **(3)**

13. Which of the following statements regarding sulphur is incorrect ?

(1) At 600°C the gas mainly consists of S_2 molecules

(2) The oxidation state of sulphur is never less than +4 in its compounds

(3) S_2 molecule is paramagnetic

(4) The vapour at 200°C consists mostly of S_8 rings

Ans. **(2)**

14. The correct order of acidic strength is :

(1) $Cl_2O_7 > SO_2 > P_4O_{10}$ (2) $CO_2 > N_2O_5 > SO_3$

(3) $Na_2O > MgO > Al_2O_3$ (4) $K_2O > CaO > MgO$

Ans. **(1)**

15. Which of the following property is not related with PH_3

(1) It is a colourless gas having rotten fish smell

(2) It is non poisonous

(3) It is slightly soluble in water

(4) It is a weak Lewis base

Ans. **(1)**

16. Which of the following is a mixed anhydride

(1) P_4O_{10} (2) SO_3 (3) Cl_2O_6 (4) SO_2

Ans. **(3)**

17. In which of the following phosphorous atoms are at the corner of tetrahydron

(1) P_4 (2) P_4O_6 (3) P_4O_{10} (4) All of these

Ans. **(1)**

18. In which of the following option product gas X and Y (other than water vapour) are same ?

(1) $Mg_2C_3 + H_2O \rightarrow X$; $Al_4C_3 + H_2O \rightarrow Y$

(2) $NH_4NO_3 \xrightarrow{\Delta} X$; $(NH_4)_2Cr_2O_7 \xrightarrow{\Delta} Y$

(3) $NH_4Cl \xrightarrow{\Delta} X$; $UREA \xrightarrow{H_2O} Y$

(4) $Zn + \text{dil. } HNO_3$ X; $Ag + \text{dil. } HNO_3 \rightarrow Y$

Ans. **(3)**

19. Which of the following statements are correct for SO_2 gas ?

(1) It acts as bleaching agent in moist conditions.

(2) It's molecule has linear geometry

(3) It's dilute solution is used as lubricant

(4) It can be prepared by the reaction of dilute H_2SO_4 with metal sulphide

Ans. **(1)**

20. Which of the following is the wrong statement ?

(1) ONCl and ONO^- are not isoelectronic. **(2)** O_3 molecule is bent

(3) Ozone is violet-black in solid state **(4)** Ozone is diamagnetic gas.

Ans. **(1)**

21. The pair in which phosphorous atoms have a formal oxidation state of +3 is :

(1) Pyrophosphorous and hypophosphoric acids

(2) Orthophosphorous and hypophosphoric acids

(3) Pyrophosphorous and pyrophosphoric acids

(4) Orthophosphorous and pyrophosphorous acids

Ans. **(1)**

22. The reaction of zinc with dilute and concentrated nitric acid, respectively, produces:

(1) NO_2 and NO **(2)** NO and N_2O **(3)** NO_2 and N_2O **(4)** N_2O and NO_2

Ans. **(2)**

23. The geometry with respect to the central atom of the following molecules are

$N(SiH_3)_3$, Me_3N, $(SiH_3)_3P$

(1) planar, pyramidal, planar (2) planar, pyramidal, pyramidal

(3) pyramidal, pyramidal, pyramidal (4) pyramidal, planar, pyramidal

Ans. **(2)**

24. In which of the following compounds, observed bond angle is found to be greater than expected, but not due to back bonding

(1) $N(SiH_3)_3$ (2) $O(CH_3)_2$ (3) $O(SiH_3)_2$ (4) All of these

Ans. **(2)**

25. Which of the following halids cannot be hydrolysed ?

(i) TeF_6 (ii) SF_6 (iii) NCl_3 (iv) NF_3

Choose the correct code

(1) iii and iv (2) i, ii and iii (3) i, ii and iv (4) ii and iv

Ans. **(4)**

26. Which of the following is an uncommon hydrolysis product of XeF_2 and XeF_4 ?

(1) Xe (2) XeO_3 (3) HF (4) O_2

Ans. **(2)**

27. Consider the oxy acids $HClO_n$ seris, here value of n is 1 to 4. Then incorrect statement regarding these oxy acids is

(1) acidic character of oxy acids increases with increasing value of n.

(2) oxidising power of oxy acids increases with decreasing value of n.

(3) thermal stability of oxy acids decreases with increasing value of n

(4) Cl–O bond order decreases with decreasing value of n

Ans. **(3)**

28. $2P \xrightarrow{-H_2O} Q \xrightarrow{-[O]} R$

If P is parent phosphoric acid then according to given information the incorrect statement is

(1) Q is pyro form and R is hypo form of given present oxy acid P

(2) Number of H-atoms present in each given oxy acid is equal to its basicity

(3) In P, Q, R oxy acids, oxidation state of central atom remains same

(4) All given oxy acids have pπ-dπ bond(s) in their structure

Ans. **(3)**

29. On heating, ammonium dichromate and barium azide separately, we get :-

(1) N_2 with ammonium dichromate and NO with barium azide

(2) N_2O with ammonium dichromate and NO_2 with barium azide

(3) N_2O with ammonium dichromate and NO with barium azide

(4) N_2 in both cases

Ans. **(4)**

30. $P-\text{oxide} \xrightarrow{H_2O} A \xrightarrow{\text{Heating}} \underset{\substack{\text{contain}\\ P-H \text{ bond}}}{\boxed{B}} + \underset{\text{Acid}}{\boxed{C}} \xrightarrow{200^\circ C} D$

Incorrect statement is :-

(1) Gas B is PH_3 (2) D is pyrophosphoric acid

(3) A is H_3PO_3 (4) D on strong heating gives P_2O_3

Ans. **(4)**

31. Which of the following statements is not correct when a mixture of NaCl and $K_2Cr_2O_7$ is gently warmed with conc. H_2SO_4:

(1) A deep red vapour is evolved

(2) The vapour when passed into NaOH solution gives a yellow solution of Na_2CrO_4

(3) Chlorine gas is evolved

(4) Chromyl chloride is formed

Ans. **(3)**

32. Which of the following does not decolourise iodine ?

(1) Na_2SO_3 (2) $Na_2S_2O_3$ (3) NaCl (4) NaOH

Ans. **(3)**

Previous Year Questions

1. Match the interhalogen compounds of Column I with the geometry in column II and assign the correct code **[NEET- 2017]**

Column I	**Column II**
(a) XX'	(i) T-shape
(b) XX'_3	(ii) Pentagonal bipyramidal
(c) XX'_5	(iii) Linear
(d) XX'_7	(iv) Square-pyramidal
	(v) Tetrahedral

Code :

	(a)	(b)	(c)	(d)
(1)	(iii)	(iv)	(i)	(ii)
(2)	(iii)	(i)	(iv)	(i)
(3)	(v)	(iv)	(iii)	(ii)
(4)	(iv)	(iii)	(ii)	(i)

Ans. **(2)**

2. When copper is heated with conc. HNO_3, it produces **[NEET - 2016]**

(1) $Cu(NO_3)_2$ and N_2O (2) $Cu(NO_3)_2$ and NO_2 (3) $Cu(NO_3)_2$ and NO (4) $Cu(NO_3)_2$ NO and NO_2

Ans. **(2)**

3. Which is the correct statement for the given acids ? **[NEET- 2016]**

(1) Phosphinic acid is a diprotic acid while phosphonic acids is a monoprotic acid

(2) Phosphinic acid is a monoprotic acid while phosphonic acid is a diprotic acid

(3) Both are diprotic acids

(4) Both are triprotic acids

Ans. **(2)**

4. Among the following, the correct order of acidity is **[NEET- 2016]**

(1) $HClO_4 < HClO_2 < HClO < HClO_3$ (2) $HClO_3 < HClO_4 < HClO_2 < HClO$

(3) $HClO < HClO_2 < HClO_3 < HClO_4$ (4) $HClO_2 < HClO < HClO_3 < HClO_4$

Ans. **(3)**

5. Which of the following orders is correct for the bond dissociation enthalpy of halogen molecules **[NEET- 2016]**

(1) $F_2 > Cl_2 > Br_2 > I_2$ (2) $I_2 > Br_2 > Cl_2 > F_2$ (3) $Cl_2 > Br_2 > F_2 > I_2$ (4) $Br_2 > I_2 > F_2 > Cl_2$

Ans. **(3)**

6. Match the compounds given in Column - I with the hybridisation and shape given in Column - II and mark the correct option. **[NEET- 2016]**

Column - I		**Column - II**	
(a)	XeF_6	(i)	Distorted octahedral
(b)	XeO_3	(ii)	Square planar
(c)	$XeOF_4$	(iii)	Pyramidal
(d)	XeF_4	(iv)	Square pyramidal

	(a)	(b)	(c)	(d)
(1)	(iv)	(i)	(ii)	(iii)
(2)	(i)	(iii)	(iv)	(ii)
(3)	(i)	(ii)	(iv)	(iii)
(4)	(iv)	(iii)	(i)	(ii)

Ans. **(2)**

7. The variation of the boiling points of the hydrogen halides is in the order HF > HI > HBr > HCl.
What explains the higher boiling point of hydrogen fluoride ? **[Re-AIPMT-2015]**

(1) The bond energy of HF molecules is greater than in other hydrogen halides.

(2) The effect of nuclear shielding is much reduced in fluorine which polarises the HF molecule.

(3) The electronegativity of fluorine is much higher than for other elements in the group.

(4) There is strong hydrogen bonding between HF molecules.

Ans. **(4)**

8. Which of the statements given below is incorrect ? **[Re-AIPMT-2015]**

(1) ONF is isoelectronic with O_2N^- (2) OF_2 is an oxide of fluorine

(3) Cl_2O_7 is an anhydride of perchloric acid (4) O_3 molecule is bent

Ans. **(2)**

9. Strong reducing behaviour of H_3PO_2 is due to **[Re-AIPMT-2015]**

(1) High oxidation state of phosphorus

(2) Presence of two –OH groups and one P – H bond

(3) Presence of one –OH group and two P – H bonds

(4) High electron gain enthalpy of phosphorus

Ans. **(3)**

10. Which of the following allotrope of phosphorous has tetrahedral discrete unit ? **[AIIMS-2015]**

(1) Red black P (2) White P (3) Red P (4) Red, Black & white P

Ans. **(2)**

11. Which one of the following element can shown +7 oxidation state with fluorine **[AIIMS-2015]**

(1) I (2) Mn (3) F (4) Br

Ans. **(1)**

12. S–S linkage absent in **[AIIMS-2015]**

(1) $H_2S_2O_7$ (2) $H_2S_2O_3$ (3) $H_2S_2O_5$ (4) $H_2S_2O_6$

Ans. **(1)**

13. Compound X react with sodium phosphate in presence of conc. HNO_3 form a yellow ppt, than X is **[AIIMS-2015]**

(1) MnO_4^{2-} (2) $MoCl_4$ (3) MoO_4^{2-} (4) AlO_2^-

Ans. **(3)**

14. Lowest oxidation state of phosphorous is in **[AIIMS-2015]**

(1) H_3PO_2 (2) H_3PO_4 (3) $H_4P_2O_7$ (4) H_3PO_3

Ans. **(1)**

15. Rhombic sulphur is soluble in :- **[AIIMS-2014]**

(1) CS_2 (2) Benzene (3) Alcohol (4) Ether

Ans. **(1)**

16. Which of the following halogen form only one oxyacids (HOX) **[AIIMS-2014]**

(1) F (2) Br (3) I (4) Cl

Ans. **(1)**

17. Acidity of diprotic acids in aqueous solutions increases in the order **[AIPMT-2014]**

(1) $H_2S < H_2Se < H_2Te$ (2) $H_2Se < H_2S < H_2Te$ (3) $H_2Te < H_2S < H_2Se$ (4) $H_2Se < H_2Te < H_2S$

Ans. **(1)**

18. Bleaching powder does not contain :- **[AIIMS-2013]**

(1) $CaCl_2$ (2) $Ca(OH)_2$ (3) $Ca(OCl)_2$ (4) $Ca(ClO_3)_2$

Ans. **(4)**

19. Which is the strongest acid in the following ? **[NEET-2013]**

(1) $HClO_3$ (2) $HClO_4$ (3) H_2SO_3 (4) H_2SO_4

Ans. **(2)**

20. Roasting of sulphides give the gas X as by product. This is a colourless gas with choking smell of burnt sulphur and causes great damages to respiratory organs as a result of acid rain. Its aqueous solution is acidic, acts as a reducing agent and its acid has never been isolated. The gas X is **[NEET-2013]**

(1) SO_2 (2) CO_2 (3) SO_3 (4) H_2S

Ans. **(1)**

21. XeF_2 is isostructural with **[NEET-2013]**

(1) ICl_2^- (2) $SbCl_3$ (3) $BaCl_2$ (4) TeF_2

Ans. **(1)**

22. Which of the following does not give oxygen on heating ? **[NEET-2013]**

(1) $Zn(ClO_3)_2$ (2) $K_2Cr_2O_7$ (3) $(NH_4)_2Cr_2O_7$ (4) $KClO_3$

Ans. **(3)**

23. Which of the following species contains three bond pairs and one lone pair around the central atom ? **[AIPMT(Prelims) - 2012]**

(1) NH_2^- (2) PCl_3 (3) H_2O (4) BF_3

Ans. **(2)**

24. When Cl_2 gas reacts with hot and concentrated sodium hydroxide solution, the oxidation number of chlorine changes from **[AIPMT(Prelims) - 2012]**

(1) Zero to –1 and zero to + 3 (2) Zero to +1 and zero to – 3

(3) Zero to +1 and zero to – 5 (4) Zero to –1 and zero to + 5

Ans. **(4)**

25. A mixture of potassium chlorate, oxalic acid and sulphuric acid is heated. During the reaction which element undergoes maximum change in the oxidation number ? **[AIPMT(Prelims) - 2012]**

(1) Cl (2) C (3) S (4) H

Ans. **(1)**

26. Sulphur trioxide can be obtained by which of the following reaction **[AIPMT(Prelims) - 2012]**

(1) $S + H_2SO_4 \xrightarrow{\Delta}$ (2) $H_2SO_4 + PCl_5 \xrightarrow{\Delta}$ (3) $CaSO_4 + C \xrightarrow{\Delta}$ (4) $Fe_2(SO_4)_3 \xrightarrow{\Delta}$

Ans. **(4)**

27. Which of the following statements is not valid for oxoacids of phosphorus ? **[AIPMT(Prelims) - 2012]**

(1) All oxoacids contain tetrahedral four coordinated phosphorus.

(2) All oxoacids contain atleast one P = O unit and one P –OH group.

(3) Orthophosphoric acid is used in the manufacture of triple superphosphate.

(4) Hypophosphorus acid is a diprotic acid.

Ans. **(4)**

28. In which of the following arrangements the given sequence in not strictly according to the property indicated against it ? **[AIPMT(Prelims) - 2012]**

(1) $HF < HCl < HBr < HI$: Increasing acidic strength

(2) $H_2O < H_2S < H_2Se < H_2Te$: Increasing pK_a values

(3) $NH_3 < PH_3 < AsH_3 < SbH_3$: Increasing acidic character

(4) $CO_2 < SiO_2 < SnO_2 < PbO_2$: Increasing oxidising power

Ans. **(2)**

29. The correct order of increasing bond angles in the following species are **[AIPMT(Prelims) - 2010]**

(1) $Cl_2O < ClO_2 < ClO_2^-$ (2) $ClO_2 < Cl_2O < ClO_2^-$ (3) $Cl_2O < ClO_2^- < ClO_2$ (4) $ClO_2^- < Cl_2O < ClO_2$

Ans. **(3)**

30. How many bridging oxygen atoms are present in P_4O_{10} ? **[AIPMT(Mains) - 2010]**

(1) 6 (2) 4 (3) 2 (4) 5

Ans. **(1)**

31. Among the following which is the strongest oxidising agent ? **[AIPMT(Prelims) - 2009]**

(1) Br_2 (2) I_2 (3) Cl_2 (4) F_2

Ans. **(4)**

32. Which one of the following orders correctly represents the increasing acid strengths of the given acids ? **[AIPMT(Prelims) - 2007]**

(1) $HOClO_3 < HOClO_2 < HOClO < HOCl$ (2) $HOCl < HOClO < HOClO_2 < HOClO_3$

(3) $HOClO_3 < HOCl < HOClO_3 < HOClO_2$ (4) $HOClO_2 < HOClO_3 < HOClO < HOCl$

Ans. **(2)**

33. Which of the following is most basic oxide ? **[AIPMT(Prelims) - 2006]**

(1) Al_2O_3 (2) Sb_2O_3 (3) Bi_2O_3 (4) SeO_2

Ans. **(3)**

34. Which of the following is not isostructural with $SiCl_4$? **[AIPMT(Prelims) - 2006]**

(1) SCl_4 (2) SO_4^{2-} (3) PO_4^{3-} (4) NH_4^+

Ans. **(1)**

35. In which of the following molecules are all the bonds not equal ? **[AIPMT(Prelims) - 2006]**

(1) ClF_3 (2) BF_3 (3) AlF_3 (4) NF_3

Ans. **(1)**

36. Which one of the following orders is not in accordance with the property stated against it ? **[AIPMT(Prelims) - 2006]**

(1) $F_2 > Cl_2 > Br_2 > I_2$: Oxidising power

(2) $HI > HBr > HCl > HF$: Acidic property in water

(3) $F_2 > Cl_2 > Br_2 > I_2$: Electronegativity

(4) $F_2 > Cl_2 > Br_2 > I_2$: Bond dissociation energy

Ans. **(4)**

Question asked prior to Medical Ent. Exams. 2005

37. The metal oxide which cannot be reduced to metal by carbon is

(1) Fe_2O_3 (2) Al_2O_3 (3) PbO (4) ZnO

Ans. **(2)**

38. In which of the following compounds, nitrogen exhibits highest oxidation state ?

(1) N_3H (2) NH_2OH (3) N_2H_4 (4) NH_3

Ans. **(1)**

39. Which of the following displaces Br_2 from an aqueous solution containing bromide ions ?

(1) I_2 (2) I_3^- (3) Cl_2 (4) Cl^-

Ans. **(3)**

40. Repeated use of which one of the following fertilizers would increase the acidity of the soil ?

(1) Ammonium sulphate (3) Superphosphate of lime

(3) Urea (4) Potassium nitrate

Ans. **(1)**

41. Which of the following oxides is most acidic ?

(1) As_2O_5 (2) P_2O_5 (3) N_2O_5 (4) Sb_2O_5

Ans. **(3)**

42. Which of the following phosphorus is the most reactive ?

(1) Scarlet phosphorus (2) White phosphorus

(3) Red phosphorus (4) Violet phosphorus

Ans. **(2)**

43. Nitrogen forms N_2, but phosphorus does not form P_2, however, it forms P_4, reason is

(1) Triple bond present between phosphorus atom

(2) $p\pi$-$p\pi$ bonding is weak

(3) $p\pi$-$p\pi$ bonding is strong

(4) Multiples bonds form easily

Ans. **(2)**

44. Which reaction is not feasible ?

(1) $2KI + Br_2 \rightarrow 2KBr + I_2$ (2) $2KBr + I_2 \rightarrow 2KI + Br_2$

(3) $2KBr + Cl_2 \rightarrow 2KCl + Br_2$ (4) $2H_2O + 2F_2 \rightarrow 4HF + O_2$

Ans. **(2)**

45. Which one of the following statements is not true ?

(1) Among halide ions, iodide is the most powerful reducing agent

(2) Fluorine is the only halogen that does not show a variable oxidation state

(3) HOCl is a stronger acid than HOBr

(4) HF is a stronger acid then HCl

Ans. **(4)**

46. Oxidation states of P in $H_4P_2O_5$, $H_4P_2O_6$, $H_4P_2O_7$, are respectively

(1) +3, +4, +5 (2) +3, +5, + 4 (3) +5, +3, +4 (4) +5, +4, +3

Ans. **(1)**

47. In which one of the following species the central atom has the type of hybridisation which is not the same as that present in the other three ?

(1) PCl_5 (2) SF_4 (3) I_3^- (4) $SbCl_5^{2-}$

Ans. **(4)**

48. Least volatile hydrogen halide is

(1) HF (2) HCl (3) HBr (4) HI

Ans. **(1)**

49. Which has ability to release bromine from KBr ?

(1) I_2 (2) Br_2 (3) F_2 (4) SO_2

Ans. **(3)**

50. Which of the following has P–P linkage ?

(1) $H_4P_2O_6$ (2) $H_4P_2O_7$ (3) HPO_3 (4) H_3PO_4

Ans. **(1)**

51. Bonds present in N_2O_5 are

(1) Only covalent (2) Only ionic

(3) Covalent and coordinate (4) Covalent and ionic

Ans. **(3)**

52. Which of the following dissolves in water but does not gives any oxyacid solution ?

(1) SO_2 (2) OF_2 (3) SCl_4 (4) SO_3

Ans. **(2)**

ASSERTION & REASON QUESTIONS

These questions consist of two statements each, printed as *Assertion* and *Reason*. While answering these Questions you are required to choose any one of the following four responses.

A. If both *Assertion* & *Reason* are True & the *Reason* is a correct explanation of the *Assertion*.

B. If both *Assertion* & *Reason* are True but *Reason* is not a correct explanation of the Assertion.

C. If *Assertion* is True but the *Reason* is False.

D. If both *Assertion* & *Reason* are False.

1. ***Assertion*** **:** Nitrogen is unreactive at room temperature but becomes reactive at elevated temperature (on heating or in the presence of catalysts).

Reason **:** In nitrogen molecule, there is extensive delocalization of electrons.

Ans. (C)

2. ***Assertion*** **:** H_3PO_2 can act as strong reducing agent and gives disproportionation reaction on heating.

Reason **:** Due to presence of one –OH group and two P–H group, H_3PO_2 is a monobasic bronsted acid.

Ans. (B)

3. ***Assertion*** **:** NO_2 is paramagnetic in gaseous state but become diamagnetic solid on cooling.

Reason **:** In gaseous state, NO_2 exists as monomer odd electron species but on cooling it dimerise to N_2O_4.

Ans. (A)

4. ***Assertion*** **:** In preparation of H_2SO_4 by contact process, SO_3 is not absorbed directly in water to from H_2SO_4.

Reason **:** SO_3 forms acid fog with water which is difficult to condense.

Ans. (A)

5. ***Assertion*** **:** NH_3 can be dried by quick lime.

Reason **:** Quick lime is also basic in nature and no reaction take place with NH_3.

Ans. (A)

6. ***Assertion*** **:** $Cl_2 + H_2O$ reaction is a disproportionation reaction and HOCl is formed.

Reason **:** Increase in pH will increase the yield of HOCl.

Ans. (C)

7. ***Assertion*** **:** NO_2 and ClO_2 both being odd electron molecule dimerise.

Reason **:** On dimerisation, NO_2 is converted to stable N_2O_4 molecule with even number of electrons.

Ans. (B)

8. ***Assertion*** **:** All inter halogens are diamagnetic.

Reason **:** AB type of interhalogen undergoes hydrolysis giving a halide ion derived from the smaller halogen and a hypohalite ion derived from the larger halogen.

Ans. (B)

9. ***Assertion*** **:** Anhyd. calcium chloride cannot be used to dry NH_3.

Reason **:** Anhyd. $CaCl_2$ forms a adduct $CaCl_2.6NH_3$ with NH_3

Ans. (A)

10. ***Assertion*** **:** The solubility of I_2 increases in water in presence of KI.

Reason **:** I_2 forms ionic polyhalide with KI.

Ans. (A)