CHEMISTRY

BOOKS - BRILLIANT PUBLICATION

P-BLOCK ELEMENTS

Level I

1. Sulphuric acid has great affinity for water because

A. acid decomposes water

B. it hydrolyses the acid

C. it decomposes the acid

D. acid forms hydrates with water

Answer: D

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2. Which one is the anhydride of $HClO_4$?

A. ClO_2

B. Cl_2O_7

C. Cl_2O

D. Cl_2O_6

Answer: B

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3. Which of the following form of interhalogen compounds does not exist?

A. IF_7

B. ClF_3

C. ICl

D. $BrCl_7$

Answer: D

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4. Which products are expected from the disproportionation of hypochlorous acid

A. $HClO_3$ and Cl_2O

B. $HClO_2$ and $HClO_4$

C. HCl and Cl_2O

D. HCl and $HClO_3$

Answer: D

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5. Which of the following statements is true?

A. H_3PO_3 is a stronger acid than H_2SO_3

B. In aqueous medium HF is a stronger acid than HCl

C. $HClO_4$ is weaker acid than $HClO_3$

D. HNO_3 is a stronger acid than HNO_2

Answer: D

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6. Which of the following compound is not known?

A. NCl_5

B. NI_3

C. $SbCl_3$

D. NCl_3

Answer: A

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7. Which ordering of compounds is according to decreasing order of the oxidation state of nitrogen?

A. HNO_3, NO, NH_4Cl, N_2

B. HNO_3, NO, N_2, NH_4Cl

C. HNO_3, NH_4Cl, NO, N_2

D. NO, HNO_3, NH_4Cl, N_2

Answer: B

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8. The following are some statements related to group 15 hydrides.

I. Reducing property increases from NH_3 to BiH_3

II. Tendency to donate lone pair decreases from NH_3 to BiH_3

III. Thermal stability of hydrides decreases from NH_3 to BiH_3

IV. Bond angle of hydrides decreases from NH_3 to BiH_3

A. I,II,III and IV

B. I,III and IV

C. I , II and IV

D. I and IV

Answer: A

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9. The hydrolysis of NCl_3 by H_2O produces

A. NH_2OH and HOCl

B. NH_2NH_2 and HCl

C. NH_4OH + HOCl

D. NH_2Cl and HOCl

Answer: C

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10. Thermal decomposition of ammonium dichromate gives

A. N_2, H_2O and Cr_2O_3

B. N_2, NH_3 and CrO

C. $(NH_4)_2CrO_4$ and H_2O

D. N_2, H_2O and Cr_2O_3

Answer: A

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11. The gases produced in the reactions Pb(NO3)2 -> Δ and 'NH4NO3' -> Δ are respectively,

A. N_2O, NO

B. N_2O, NO_2

C. NO, NO_2

D. NO_2, N_2O

Answer: D

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12. Nitrogen dioxide is not produced on heating

A. KNO_3

B. $Pb(NO_3)_2$

C. $Cu(NO_3)_2$

D. $AgNO_3$

Answer: A

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13. Which of the following properties is not shown by NO?

A. Its bond order is 2.5

B. It is diamagnetic in the gaseous state

C. It is a neutral oxide

D. It combines with oxygen to form nitrogen dioxide

Answer: B

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14. Nitric acid can be obtained from ammonia via the formation of the intermediate compounds

A. nitric oxide and nitrogen dioxide

B. nitrogen and nitric oxide

C. nitric oxide and dinitrogen pentoxide

D. nitrogen and nitrous oxide

Answer: A

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

A. N_2O and NO_2

B. NO_2 and NO

C. NO and N_2O

D. NO_2 and N_2O

Answer: A

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16. When copper is heated with conc. HNO_3 it produces

A. $Cu(NO_3)_2$, NO and NO_2

B. $Cu(NO_3)_2$ and N_2O

C. $Cu(No_3)_2$ and NO_2

D. $Cu(NO_3)_2$ and NO

Answer: C

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17. Of the following acids, the one which has the capability to form complex compound and also possesses oxidising and reducing properties is

A. HNO_3

B. HNO_2

C. HCOOH

D. HCN

Answer: B

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18. The oxidation state of phosphorus in cyclotrimetaphosphoric acid is

A. $+3$

B. $+5$

C. -3

D. $+2$

Answer: B

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19. The correct formula of salt formed by the neutralisation of hypophosphorus acid with NaOH is

A. Na_3PO_2

B. Na_3PO_3

C. NaH_2PO_2

D. Na_2HPO_2

Answer: C

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20. Sulphuryl chloride (SO_2Cl_2) reacts with white phosphours (P_4) to give

A. PCl_5, SO_2

B. $PCl_3, SOCl_2$

C. PCl_5, SO_2, S_2Cl_2

D. $OPCl_3, SO_2, S_2Cl_2$

Answer: A

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21. Which of the following is the wrong statement?

A. Ozone is diamagnetic gas

B. ONCl and ONO^- are isoelectronic

C. O_3 molecule is bent

D. Ozone is violet-black in solid state

Answer: B

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22. Identify the incorrect statement from the following

A. Oxides of nitrogen in the atmosphere can cause the depletion of ozone layer

B. Ozone absorbs the intense ultraviolet radiation of the sun

C. Depletion of ozone layer is because of its chemical reactions with chlorofluoroalkanes

D. Ozone absorbs infrared radiation

Answer: D

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23. Roasting of sulphides gives the gas X as a by product. This is a colourless gas with choking smell of burnt sulphur and causes great damage 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

A. CO_2

B. SO_3

C. H_2S

D. SO_2

Answer: D

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24. Which of the following statements is correct when SO_2 is passed through acidified $K_2Cr_2O_7$ solution?

A. SO_2 is reduced

B. Green $Cr_2(SO_4)_3$ is formed

C. The solution turns blue

D. The solution is decolourised

Answer: B

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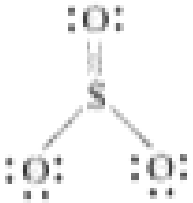
25. Which of the following structures is the most preferred and hence of lowest energy for SO_3?

A.



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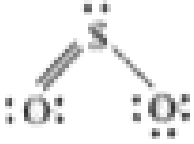
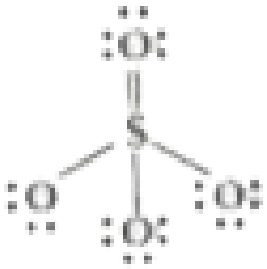
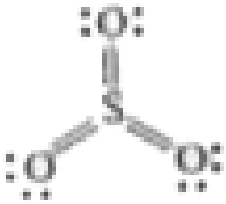




C.



D.

Answer: D

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26. Consider following properties of the noble gases which are correct .

(I) They readily form compounds which are colourless.

(II) They generally do not form ionic compounds.

(III) Xenon has variable oxidation states in its compounds.

(IV) The smaller He and Ne do not form clathrate compounds.

A. I,II,III

B. II,III , IV

C. I,III,IV

D. I,II,III,IV

Answer: B

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27. In $SOCl_2$, the Cl-S-Cl and Cl-S-O bond angles are

A. 130° and 115°

B. 106° and 96°

C. 107° and 108°

D. 96° and 106°

Answer: D

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28. Which of the following orders is correct for the bond dissociation enthalpy of halogen molecules?

A. $Br_2 > I_2 > F_2 > Cl_2$

B. $F_2 > Cl_2 > Br_2 > I_2$

C. $I_2 > Br_2 > Cl_2 > F_2$

D. $Cl_2 > Br_2 > F_2 > I_2$

Answer: D

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29. Which among the following factors is most important in making fluorine the strongest oxidising agent?

A. electron affinity

B. ionization energy

C. hydration energy.

D. bond dissociation energy

Answer: C

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30. When Br_2 is treated with aqueous solutions of NaF, NaCl, Nal separately

A. F_2, Cl_2 and I_2 are liberated

B. Only F_2 and Cl_2 are liberated

C. Only I_2 is liberated

D. Only Cl_2 is liberated

Answer: C

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31. What is X, in the following reaction ?

$$KHSO_4 + F_2 \rightarrow HF + X$$

A. K_2SO_4

B. $K_2S_2O_4$

C. $K_2S_2O_3$

D. $K_2S_2O_8$

Answer: D

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32. The correct order of increasing bond angles in the following species is

A. $ClO_2^- < Cl_2O < ClO_2$

B. $Cl_2O < ClO_2 < ClO_2^-$

C. $ClO_2 < Cl_2O < ClO_2^-$

D. $Cl_2O < ClO_6^- < ClO_2$

Answer: A

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33. When Cl_2 gas reacts with hot and concentrated sodium hydroxide solution, the oxidation number of chlorine changes from

A. zero to +1 and zero to +5

B. zero to -1 and zero to +5

C. zero to -1 and zero to +3

D. zero to +1 and zero to -3

Answer: B

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34. Among the following which one is wrong-statement?

A. PH_5 and $BiCl_5$ do not exist

B. $p\pi - d\pi$ bonds are present in SO_2

C. SeF_4 and CH_4 have same shape

D. I_3^+ has bent geometry

Answer: C

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35. In which of the following pairs , the two species are not isostructural ? PCl_4^+ and $SiCl_4$, PF_5 and BrF_5, AlF_6^{3-} and SF_6, CO_3^{2-} and NO_3^-

A. PCl_4^+ and $SiCl_4$

B. PF_5 and BrF_5

C. AlF_6^{3-} and SF_6

D. CO_3^{2-} and NO_3^-

Answer: B

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36. In which of the following pairs both the species are not isostructural?

A. Diamond, silicon carbide

B. NH_3, PH_3

C. XeF_4, XeO_4

D. $SiCl_4, PCl_4^+$

Answer: C

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37. Which of the following species has equal number of σ- and π-bonds? (C N) 2 C H 2 (C N) 2 H C O 3- X e O 4

A. $(CN)_2$

B. $CH_2(CN)_2$

C. HCO_3^-

D. XeO_4

Answer: D

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38. Which of the following reactions of xenon compounds is not feasible?

A. $3XeF_4 + 6H_2O \rightarrow 2Xe + XeO_3 + 12HF + 1.5O_2$

B. $2XeF_2 + 2H_2O \rightarrow 2Xe + 4HF + O_2$

C. $XeF_6 + RbF \rightarrow Rb[XeF_7]$

D. $XeO_3 + 6HF \rightarrow XeF_6 + 3H_2O$

Answer: D

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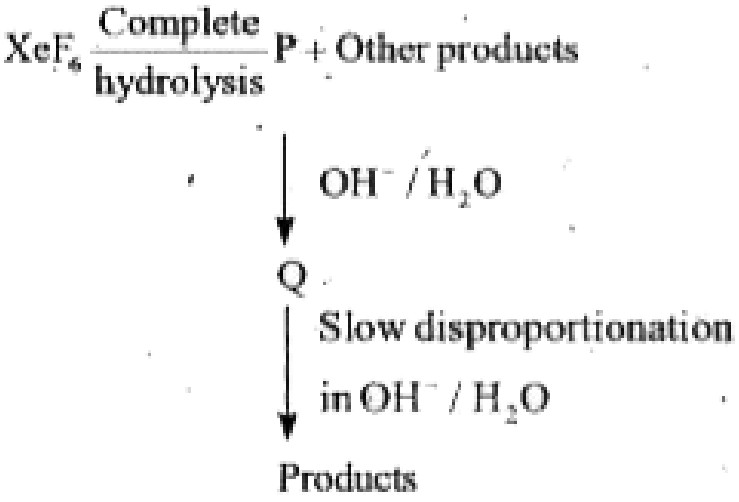
39. Under ambient conditions, the total number of gases released as products in the final step of the reaction scheme

shown below is



A. 0

B. 1

C. 2

D. 3

Answer: C

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40. In which of the following arrangements, the order is NOT according to the property indicated against it?

A. $CO_2 < SiO_2 < SnO_2 < PbO_2$: Increasing oxidizing power

B. $HF < HCl < HBr < HI$: Increasing acidic strength

C. $NH_3 < PH_3 < AsH_3 < SbH_3$: Increasing basic strength

D. $B < C < O < N$: Increasing first ionization enthalpy

Answer: C

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41. Which one of the folowing does not have a pyramidal shape?

A. $(CH_3)_3N$

B. $(SiH_3)_3N$

C. $P(CH_3)_3$

D. $P(SiH_3)_3$

Answer: B

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42. The element that has the least tendency to show the inert-pair effect is

A. Bi

B. P

C. Sb

D. N

Answer: D

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43. $(NH_4)_2Cr_2O_7$ on heating liberates a gas. The same gas will be obtained by

A. heating NH_4NO_2

B. heating NH_4NO_3

C. treating Mg_3N_2 with H_2O

D. heating H_2O_2 on $NaNO_2$

Answer: A

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44. N_2 forms NCI_3 whereas P can form both PCl_3 and PCl_5 . Why?

A. P has d orbitals which can be used for bonding but N_2 does not have d orbitals

B. N atom is larger than P in size

C. P is more reactive towards Cl than N

D. The size of N is comparable to Cl while P size is greater than that of Cl

Answer: A

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

A. The vapour at $200^\circ C$ consists mostly of S_8 rings

B. At $600^\circ C$ the gas mainly consists of S_2 molecules

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

D. S_2 molecule is paramagnetic

Answer: C

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46. The number of S-S bonds in sulphur trioxide trimer, (S_3O_9) is

A. 3

B. 2

C. 1

D. 0

Answer: D

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47. Hydrolysis of one mole of peroxydisulphuric acid produces

A. two moles of sulphuric acid

B. two moles of peroxymonosulphuric acid

C. one mole of sulphuric acid and one mole of peroxymonosulphuric acid

D. one mole of sulphuric acid, one mole of peroxymonosulphuric acid and one mole of hydrogen peroxide

Answer: A

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48. Identify the incorrect statement among the following:

A. Br_2 reacts with hot and strong NaOH solution to give NaBr, $NaBrO_4$ and H_2O

B. Ozone reacts with SO_2 to give SO_3

C. Silicon reacts with NaOH(aq) in the presence of air to give Na_2SiO_3 and H_2O

D. Cl_2 reacts with excess of NH_3 to give N_2 and NH4Cl

Answer: A

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49. Which of the following xenon compounds may not be obtained by hydrolysis of xenon fluorides? X e O 2 F 2 X e O F 4 X e O 3 X e O 4

A. XeO_2F_2

B. $XeOF_4$

C. XeO_3

D. XeO_4

Answer: D

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50. Which one of the following is the correct pair with respect to molecular formula of xenon compound and hybridization state of xenon in it?

A. XeF_4, sp^3

B. XeF_2, sp

C. XeF_2, sp^3d

D. XeF_4, sp^2

Answer: C

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Level Ii

1. What may be expected to happen when phosphine gas is mixed with chlorine gas?

A. PCl_5 and HCl are formed and the mixture cools down

B. PH_3. Cl_2 is formed with warming up

C. PCl_3 and HCl are formed and the mixture warms up

D. The mixture only cools down

Answer: A

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2. Sulphur on boiling with NaOH solution gives

A. $Na_2SO_3 + H_2S$

B. $Na_2S_2O_3 + Na_2S$

C. $Na_2S_2O_3 + NaHSO_3$

D. $Na_2SO_3 + SO_2$

Answer: B

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3. At room temperature, H_2O is liquid while H_2S is a gas. The reason is

A. electronegativity of O is greater than S

B. difference in the bond angles of both the molecules.

C. association takes place in the H_2O due to H-bonding while no H-bonding in H_2S

D. O and S belong to different periods

Answer: C

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4. Iodine is liberated when potassium iodide reacts with a solution of Z n S O 4 C u S O 4 (N H 4) 2 S O 4 N a 2 S O 4

A. $ZnSO_4$

B. $CuSO_4$

C. $(NH_4)_2SO_4$

D. Na_2SO_4

Answer: B

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5. The number of P -O- P bonds in the structure of phosphorus pentoxide and phosphorus trioxide are respectively

A. 5,5

B. 6,5

C. 5,6

D. 6,6

Answer: D

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6. A substance which gives a yellow precipitate when boiled with an excess of nitric acid and ammonium molybdate and red precipitate with $AgNO_3$ is

A. orthophosphate

B. pyrophosphate

C. metaphosphate

D. hypophosphate

Answer: A

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7. Which one of the following statements regarding helium is incorrect?

A. It is used to produce and sustain powerful super conducting magnets

B. It is used in gas-cooled nuclear reactors

C. It is used to fill gas balloons instead of hydrogen because it is lighter and non-inflammable

D. It is used as a cryogenic agent for carrying out experiments at low temperature

Answer: C

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8. Which of the following statement is wrong?

A. The stability of hydrides increases from NH_3 to BiH_3 in group 15 of the Periodic table

B. Nitrogen can't form $d\pi - p\pi$ bond

C. Single N-N bond is weaker than the single P-P bond

D. N_2O_4 has two resonance structure

Answer: A

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9. Conc. HNO_3 stains skin and wool yellow because

A. The skin and wool is burned by acid

B. Nitro cellulose is formed

C. The proteins are converted into xanthoproteins

D. The water is removed by acid

Answer: C

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10. Nitrogen reacts with calcium and carbon or when N_2 gas is passed over heated calcium carbide (at 1070 K) it gives ..... Which is an important fertiliser marketed under the name Nitrolium

A. Calcium nitrate

B. Calcium cyanide

C. Calcium cyanamide

D. Calcium nitride

Answer: C

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11. NH_3 has pyramidal structure with HNH bond angle of 107°. It forms complexes with cations. Which of the following does not form complex with NH_3?

A. $Ag^{\oplus}$

B. Cu^{2+}

C. Cd^{2+}

D. Pb^{2+}

Answer: D

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12. Ordinary strong solution of HCl, HNO_3 and H_2SO_4 contains roughly

A. 1/5, 2/3 and 3/3 fractions of pure acid and water respectively

B. 2/3, 1/5 and 3/3 fractions of pure acid and water respectively

C. 2/3 , 3/3 and 1/5 fractions of pure acid and water respectively

D. 2/3,1/3 and 3/5 fractions of pure acid and water respectively

Answer: A

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13. Dilute HNO_3 cannot be concentrated beyond 68% by boiling because

A. On boiling HNO_3 is decomposed

B. On boiling HNO_3 produces a large amount of heat which is uncontrollable

C. It forms a constant boiling mixture with H_2O boiling at 394 K

D. It can be concentrated beyond 68% by steam distillation

Answer: C

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14. Paris green was used as a pigment due to unique light green colour but now-a-days it is used as an insecticide. It is prepared by boiling verdigris (basic acetate of copper) arsenious oxide and acetic acid together. It is (C H 3 C O O) 2 C u .3 C u (A s O 2) 2 C u 3 (A s O 4) 2 C u 4 (C H 3 C O O) 2 (A s O 2) 2 C u (O H) 2 . C u 3 A s 2

A. $(CH_3COO)_2Cu.3Cu(AsO_2)_2$

B. $Cu_3(AsO_4)_2$

C. $Cu_4(CH_3COO)_2(AsO_2)_2$

D. $Cu(OH)_2.Cu_3As_2$

Answer: A

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15. Which one of the following halide does not hydrolyse

A. $SbCl_3$

B. $AsCl_3$

C. PCl_3

D. NF_3

Answer: D

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16. Following tests are shown by

(i) Decolourisation of acidified soln. of $KMnO_4$

(ii) Liberation of l_2 from an acidified soln. of KI

(iii) On treatment with dil HCl, brown fumes of NO_2

A. Nitrites

B. Nitrates

C. Ammonium salts

D. Methyl amine

Answer: A

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17. PCl_5 and PH_3 exist but PH_5 does not because

A. PH_5 is unstable

B. Phosphorous has no vacant orbitals

C. Phosphorous exists as P_4

D. Electro negativity of hydrogen is less as compared to chlorine to excite electron from p orbital to d orbital for bond formation

Answer: D

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18. Holme's signals produce burning gases which serve as a signal to the approaching ships contains

A. A mixture of Ca_3P_2 and CaC_2

B. A mixture of Ca_3P_2 and KOH

C. A mixture of CaC_2 and KOH

D. A mixture of Ca_3P_2, CaC_2 and KOH

Answer: A

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19. If phosphorous acid is allowed to react with excess of KOH, the product obtained is

A. K_3PO_3

B. KH_2SO_3

C. K_2HPO_3

D. $KHPO_3$

Answer: C

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20. When NH_4OH is added to copper sulphate solution, blue colour is obtained due to formation of

A. $Cu(NH_3)_4SO_4$

B. $Cu(NH_3SO_4)_3$

C. $Cu(OH)_2$

D. CuO

Answer: A

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21. The number of P-O-P and P-OH bonds present respectively in pyrophosphoric acid molecule are

A. 2,3

B. 1,8

C. 1,4

D. 1,2

Answer: C

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22. When ammonia is heated with CO_2 under pressure, the product is

A. $(NH_4)_2CO_3$

B. NH_2CONH_2

C. NH_2COONH_4

D. NH_4HCO_3

Answer: B

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23. White phosphorus reacts with caustic soda. The products are PH_3 and NaH_2PO_2. This reaction is an example of

A. Oxidation

B. Reduction

C. Neutralisation

D. Disproportionation

Answer: D

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24. Nitrogen molecule is chemically less active because of its

A. Small dissociation energy

B. High dissociation energy

C. High electronegativity

D. Stable electronic configuration

Answer: B

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25. PCl_5 is kept in well stoppered bottles because

A. It is highly volatile

B. It reacts readily with moisture

C. It reacts with oxygen

D. It is explosive

Answer: B

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26. The BCl_3 is a planar molecule whereas NCl_3 is pyramidal because

A. N-CI bond is more covalent than B-Cl bond

B. B-Cl bond is more polar than N-Cl bond

C. Nitrogen atom is smaller than boron

D. BCl_3 has no lone pair but NCl_3 has a lone pair of electron

Answer: D

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27. Hydrolysis of NCl_3 gives NH_3 and X. Which of the following is X?

A. $HClO_4$

B. $HClO_3$

C. HOCl

D. $HClO_2$

Answer: C

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28. Atoms in P_4 molcule of white phosphorus are arranged regularly in the following way:

A. At the corners of a cube

B. At the corners of an octahedron

C. At the corners of a tetrahedron

D. At the centre and corners of a tetrahedron

Answer: C

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29. One mole of H_3PO_3 on reaction with excess of NaOH gives:

A. one mole of Na_2HPO_3

B. two moles of $Na_2H_2PO_3$

C. two moles of Na_2HPO_3

D. one mole of Na_3PO_3

Answer: A

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30. If O_2 is removed from the formula of anhydride of HNO_2 , their the formula of the resulting compound satisfies which of the following properties?

A. It produces tears in eyes

B. It supports combustion

C. It is paramagnetic

D. It cannot react with red hot copper

Answer: B

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31. Which of the following is correct?

A. N_2O is a laughing gas and is angular in shape

B. NO_2 is a sweet smelling and is angular in shape

C. NO is a colourless gas and acidic in nature

D. NO_2 on reaction with NaOH gives a mixture of two salts

Answer: D

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32. The oxyacid of phosphorus in which phosphorus has the lowest oxidation state is:

A. hypophosphorus acid

B. orthophosphoric acid

C. pyrophosphoric acid

D. metaphosphoric acid

Answer: A

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33. How many peroxy linkages are present in pyrophosphric acid?

A. 0

B. 1

C. 2

D. 3

Answer: A

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34. Which of the following options are true (T) and which are false (F) ?

(i) Ionic mobility is the highest for I^- in water as compared to other halides

(ii) Stability order is: $Cl_3^- > Br_3^- > I_3^-$

(iii) Reactivity order is: $F < Cl < Br < I$

(iv) Oxidizing power order is: $F_2 < Cl_2 < Br_2 < I_2$

A. TFTF

B. TFFF

C. TFFT

D. FTFT

Answer: B

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35. Which of the following series of fluorides is known?

A. XeF_2, XeF_4, XeF_3

B. XeF_2, XeF_4, XeF_6

C. XeF_2, XeF_3, XeF_6

D. XeF_2, XeF_4, XeF_5

Answer: B

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36. The compounds of S obtained by reaction of S and conc. hot KOH when reacted separately with dil. HCI produce

A. different gases, SO_2 and H_2S

B. same gas SO_2

C. S is obtained back

D. same gas H_2S

Answer: A

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37. Which of the following pseudohalides does not form dimer like halogen X_2 ?

A. CN^-

B. SCN^-

C. $SeCN^-$

D. OCN^-

Answer: D

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38. Which blue-liquid is obtained on reacting equimolar amounts of two gases at $-30^\circ C$? N 2 O N 2 O 3 N 2 O 4 N 2 O 5

A. N_2O

B. N_2O_3

C. N_2O_4

D. N_2O_5

Answer: B

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39. Select correct statement.

(i) Mixture of NH_4Cl and $NaNO_2$ on heating gives N_2 gas .

(ii) CFC is used as refrigerating fluid and as propellant in aerosols

(iii) Phosgene is formed when P_4 reacts with NaOH

(iv) Phosgene dissolves in water forming P_2O_5

A. i and ii

B. ii and iii

C. iii and iv

D. i only

Answer: A

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40. The true statement for the acids of phosphorus, 'H3PO2, H3PO3 and H3PO4 ' is

A. their acidic nature is : $H_3PO_4 < H_3PO_3 < H_3PO_2$

B. all of them are reducing in nature

C. all of them are tribasic acids .

D. the geometry is tetrahedral in all the three

Answer: D

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41. $NH_4Cl(s)$ is heated in a test tube. Vapours are brought in contact with red litmus paper, which changes to blue and then to red. It is because of

A. formation of NH_4OH and HCl

B. formation of NH_3 and HCl

C. greater diffusion of NH_3 than HCl

D. greater diffusion of HCl than NH_3

Answer: C

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42. The thermal stability of hydrides of oxygen family is in order :

A. $H_2Po < H_2Te < H_2Se < H_2S < H_2O$

B. $H_2Po < H_2O < H_2Te < H_2Se < H_2S$

C. $H_2S < H_2O < H_2Te < H_2Se < H_2Po$

D. $H_2O < H_2S < H_2Te < H_2Se < H_2Po$

Answer: A

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43. Which of the following can convert acidified $Cr_2O_7^{2-}$ to green? $SO_2 / H_2SO_3 / H_2SO_4$, $SO_3 / H_2SO_3 / H_S$,

$SO_3^{2-} / H_2S / Fe^{2+}, S_2O_3^{2-} / SO_3 / Fe^{3+}$

A. $SO_2 / H_2SO_3 / H_2SO_4$

B. $SO_3 / H_2SO_3 / H_S$

C. $SO_3^{2-} / H_2S / Fe^{2+}$

D. $S_2O_3^{2-} / SO_3 / Fe^{3+}$

Answer: C

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44. Bleaching of a fabric cloth is done using Aand excess of chlorine is removed using B. A and B are respectively. C a O C l 2 , N a 2 S O 3 N a 2 S 2 O 3 , C a O C l 2 C a C l 2 , N a 2 S 2 O 3 C a (O C l) 2 , N a 2 S 2 O 3

A. $CaOCl_2, Na_2SO_3$

B. $Na_2S_2O_3, CaOCl_2$

C. $CaCl_2, Na_2S_2O_3$

D. $Ca(OCl)_2, Na_2S_2O_3$

Answer: D

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45. Select incorrect statement

A. ClO_2 and Cl_2O are used as bleaching agents for paper pulp and textiles

B. OCl^- (hypohalites) salts are used as detergent.

C. OCl^- disproportionates in alkaline medium

D. BrO_3 is oxidised to Br_2 by Br^- in acidic medium

Answer: B

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46. Which of the underlined atoms in oxyacids have sp^3 hybridised atoms?

A. $H\underline{Cl}O_4$, $H_2\underline{S}O_4$, $H\underline{N}O_2$

B. $H_2\underline{S}O_4$, $H_3\underline{P}O_4$, $H\underline{N}O_3$

C. $H\underline{Cl}O_4$, $H_2\underline{S}O_4$, $H_2\underline{S}O_5$

D. $H\underline{Cl}O_4$, $H\underline{N}O_3$, $H\underline{Cl}O_3$

Answer: C

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47. In the preparation of HBr or HI, NaX (X=Br, I) is treated with H_3PO_4 and not by conc. H_2SO_4 and since

A. H_2SO_4 makes the reaction reversible

B. H_2SO_4 oxidises HX to X_2 (Br,I)

C. Na_3PO_4 is water soluble

D. Na_2SO_4 is water soluble

Answer: B

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48. Cl_2O, Br_2O, I_2O have positive value of ΔG (free energy) indicating that

A. these oxides are stable

B. these oxides are unstable and changes to X_2 and O_2

C. these disproportionate into X^- and XO^-

D. these oxides can form interhalogen compounds

Answer: B

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49. Select correct statements:

A. Helium has the lowest melting point and boiling point

B. Helium can diffuse through rubber, PVC and even glass

C. Ar, Kr and Xe form clathrate

D. All the above are correct statements

Answer: D

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50. Basic character of fluorides increases in the order X e F 6 < X e F 4 < X e F 2 X e F 2 < X e F 4 < X e F 6 X e F 2 = X e F 4 < X e F 6 X e F 2 > X e F 4 < X e F 6

A. $XeF_6 < XeF_4 < XeF_2$

B. $XeF_2 < XeF_4 < XeF_6$

C. $XeF_2 = XeF_4 < XeF_6$

D. $XeF_2 > XeF_4 < XeF_6$

Answer: A

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Level Ii Assertion And Reason

1. Assertion : Salts of ClO_3^- and ClO_4^- are well known but those of FO_3^- and FO_4^- are non-existent.

Reason : F is more electronegative than O while Cl is less electronegative than O.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: A

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2. Assertion : Xenon fluorides are well known and stable but the corresponding chlorides have not been reported.

Reason : Xe-F bond is more strong than Xe-Cl bond and F_2 molecule has low bond dissociation energy than that of Cl_2 molecule.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: A

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3. Assertion Although PF_5, PCl_5 and PBr_5 are known, the pentahalides of nitrogen have not been observed.

Reason : Phosphorus has lower electronegativity than nitrogen.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: B

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4. Assertion : F atom has a less negative election gain enthalpy than Cl atom.

Reason : Additional electrons are repelled more effectively by 3p electrons in Cl atom than by 2p electrons in F-atom.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: C

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5. Assertion : White phosphorus is more reactive than red phosphorus.

Reason : Red phosphorus consists of P_4 tetrahedral units linked to one another to form linear chains.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: B

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6. Assertion: SF_6 can't be hydrolysed but SF_4 can be.

Reason: Six fluorine atoms in SF_6 prevent the attack of H_2O on sulphur atom of SF_6

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: A

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7. Assertion : In vapour state sulphur is paramagnetic in nature.

Reason : In vapour state sulphur exists as S_2 molecule.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: A

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8. Assertion : Fluorine combines with sulphurto form SF_6 but no other halogen forms hexahalide wth sulphur.

Reason The reactivity of halogens increases as the atomic number increases.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: C

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9. Assertion : Fluorine oxidises water to oxygen whereas chlorine and bromine react with water to form corresponding hydrohalic and hypohalous acids.

Reason : The reactivity of halogens increases down the group.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: C

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10. Assertion : $HClO_4$ is a stronger acid than $HClO_3$

Reason : Oxidation state of chlorine in $HClO_4$ is +7 and in $HClO_3$ is +5.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: B

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11. Assertion : The covalence of nitrogen in N_2O_5 is 5.

Reason : Nitrogen can expand its covalence beyond 4.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: D

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12. Assertion: Molecular nitrogen is less reactive than molecular oxygen

Reason The bond length of N_2 is shorter than that of O_2

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: B

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13. Assertion : On cooling, the brown colour of nitrogen dioxide disappears.

Reason : On cooling, NO_2 undergoes dimerisation resulting in the pairing of odd electron of NO_2

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: A

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14. Assertion : Elementary phosphorus exists in three principal allotropic forms, i.e., white (yellow), red (or violet) and black.

Reason : Of the three forms, white phosphorus is the most important and most reactive.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: B

15. Assertion : H-S-H bond angle in H_2S is closer to 90° but: H-O-H bond angle in H_2O is 104.5°.

Reason : lp-lp repulsion is stronger in H_2S than in H_2O.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: C

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16. Assertion : HOF bond angle is higher than HOCI bond angle in HOX.

'Reason : Oxygen is more electronegative than halogens.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: D

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17. Assertion : Noble gases have positive electron gain enthalpy.

Reason : Noble gases have stable closed shell electronic configuration.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: A

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18. Assertion : The O-O bond length in H_2O_2 is shorter than that of O_2F_2

Reason : H_2O_2 is an ionic compound.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: D

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19. Assertion : The aqueous solution of XeF_2 is powerful oxidising agent.

Reason: The hydrolysis of XeF_2 is slow in dilute acid but rapid in basic solution.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: B

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20. Assertion : Superoxides of alkali metals are paramagnetic.

Reason : Superoxides contain the ion O_2^- which has one unpaired electron.

A. If both Assertion and Reason are correct and Reason is the correct explanation of Assertion

B. If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion

C. If Assertion is correct , but Reason is incorrect

D. If both Assertion and Reason are incorrect

Answer: A

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Level I

1. Sulphuric acid has great affinity for water because

A. acid decomposes water

B. it hydrolyses the acid

C. it decomposes the acid

D. acid forms hydrates with water

Answer: D

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2. Which of the following is the anhydride of $HClO_4$?

A. ClO_2

B. Cl_2O_7

C. Cl_2O

D. Cl_2O_6

Answer: B

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3. Which of the following form of interhalogen compounds does not exist?

A. IF_7

B. CIF_3

C. ICI

D. $BrCl_7$

Answer: D

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4. Which products are expected from the disproportionation of hypochlorous acid

A. $HClO_3$ and Cl_2O

B. $HClO_2$ and $HClO_4$

C. HCl and Cl_2O

D. HCl and $HClO_3$

Answer: D

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5. Which of the following statements is true?

A. H_3PO_3 is a stronger acid than H_2SO_3

B. In aqueous medium HF is a stronger acid than HCI

C. $HCIO_4$ is weaker acid than $HCIO_3$

D. HNO_3 is a stronger acid than HNO_2

Answer: D

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6. Which of the following compound is not known?

A. NCl_5

B. NI_3

C. $SbCl_3$

D. NCl_3

Answer: A

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7. Which ordering of compounds is according to decreasing order of the oxidation state of nitrogen?

A. HNO_3, NO, NH_4, N_2

B. HNO_3, NO, N_2, NH_4Cl

C. HNO_3, NH_4Cl, NO, N_2

D. NO, HNO_3, NH_4Cl, N_2

Answer: B

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8. The following are some statements related to group 15 hydrides.

I. Reducing property increases from NH_3 to BiH_3

II. Tendency to donate lone pair decreases from NH_3 to BiH_3

III. Thermal stability of hydrides decreases from NH_3 to BiH_3

IV. Bond angle of hydrides decreases from NH_3 to BiH_3

A. I,II,III and IV

B. I,III and IV

C. I,II and IV

D. I and IV

Answer: A

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9. The hydrolysis of NCl_3 by H_2O produces

A. NH_2OH and $HOCl$

B. NH_2NH_2 and HCl

C. $NH_4OH + HOCl$

D. NH_2Cl and $HOCl$

Answer: C

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10. Thermal decomposition of ammonium dichromate gives

A. N_2, H_2O and Cr_2O_3

B. N_2, NH_3 and CrO

C. $(NH_4)_2CrO_4$ and H_2O

D. N_2, H_2O and Cr_2O_3

Answer: A

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11. The gases produced in the reactions Pb(NO3)2 -> Δ and 'NH4NO3' -> Δ are respectively,

A. N_2O, NO

B. N_2O, NO_2

C. NO, NO_2

D. NO_2, N_2O

Answer: D

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12. Nitrogen dioxide is not produced on heating

A. KNO_3

B. $Pb(NO_3)_2$

C. $Cu(NO_3)_2$

D. $AgNO_3$

Answer: A

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13. Which of the following properties is not shown by NO?

A. Its bond order is 2.5

B. It is diamagnetic in the gaseous state

C. It is a neutral oxide

D. It combines with oxygen to form nitrogen dioxide

Answer: B

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14. Nitric acid can be obtained from ammonia via the formation of the intermediate compounds

A. nitric oxide and nitrogen dioxide

B. nitrogen and nitric oxide

C. nitricoxide and dinitrogen penloxide

D. nitrogen and nitrous oxide

Answer: A

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

A. N_2O and NO_2

B. NO_2 and NO

C. NO and N_2O

D. NO_2 and N_2O

Answer: A

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16. When copper is heated with conc. HNO_3 it produces

A. $Cu(NO_3)_2$, NO and NO_2

B. $Cu(NO_3)_2$ and N_2O

C. $Cu(NO_3)_2$ and NO_2

D. $Cu(NO_3)_2$ and NO

Answer: C

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17. Of the following acids, the one which has the capability to form complex compound and also possesses oxidising and reducing properties is

A. HNO_3

B. HNO_3

C. $HCOOH$

D. HCN

Answer: B

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18. The oxidation state of phosphorus in cyclotrimetaphosphoric acid is

A. $+3$

B. $+5$

C. -3

D. $+2$

Answer: B

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19. The correct formula of salt formed by the neutralisation of hypophosphorus acid with NaOH is

A. Na_3PO_3

B. Na_3PO_3

C. NaH_2PO_2

D. Na_2HPO_3

Answer: C

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20. Sulphuryl chloride (SO_2Cl_2) reacts with white phosphours (P_4) to give

A. PCl_5, SO_2

B. PCl_2, $SOCl_2$

C. PCl_5, SO_2, S_2Cl_2

D. $OPCl_3$, SO_2, S_2Cl_2

Answer: A

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21. Which of the following is the wrong statement?

A. Ozone is diamagnetic gas

B. ONCI and ONO^- are isoelectronic

C. O_3 molecule is bent

D. Ozone is violet-black in solid state

Answer: B

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22. Identify the incorrect statement from the following

A. Oxides of nitrogen in the atmosphere can cause the depletion of ozone layer

B. Ozonc absorbs the intense ultraviolet radiation of the sun

C. Depletion of ozone layer is because of its chemical reactions with chlorofluoroalkanes

D. Ozone absorbs infrared radiation

Answer: D

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23. Roasting of sulphides gives the gas X as a by product. This is a colourless gas with choking smell of burnt sulphur and causes great damage 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

A. CO_2

B. SO_3

C. H_2S

D. SO_2

Answer: D

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24. Which of the following statements is correct when SO_2 is passed through acidified $K_2Cr_2O_7$ solution?

A. $SO_2$is reduced

B. Green $Cr_2(SO_4)_3$ is formed

C. The solution turns blue

D. The solution is decolourised

Answer: B

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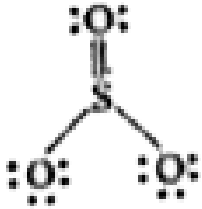
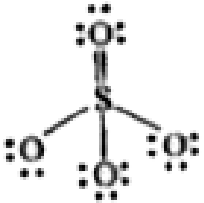
25. Which of the following structures is the most preferred and hence of lowest energy for SO_3?

A.

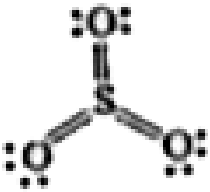


B.

C.



D.



Answer: D

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26. Consider following properties of the noble gases which are correct .

(I) They readily form compounds which are colourless.

(II) They generally do not form ionic compounds.

(III) Xenon has variable oxidation states in its compounds.

(IV) The smaller He and Ne do not form clathrate compounds.

A. I,II,III

B. II,III,IV

C. I,III,IV

D. I,II,III,IV

Answer: B

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27. In $SOCl_2$, the Cl-S-Cl and Cl-S-O bond angles are

A. 130° and 115°

B. $106^\circ C$ and 96°

C. 107° and 108°

D. 96° and 106°

Answer: D

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28. Which of the following orders is correct for the bond dissociation enthalpy of halogen molecules?

A. $Br_2 > I_2 > F_2 > Cl_2$

B. $F_2 > Cl_2 > Br_2 > I_2$

C. $I_2 > Br_2 > Cl_2 > F_2$

D. $Cl_2 > Br_2 > F_2 > I_2$

Answer: D

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29. Which among the following factors is most important in making fluorine the strongest oxidising agent?

A. electron affinity

B. ionization energy

C. hydration energy

D. bond dissociation energy

Answer: C

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30. When Br_2 is treated with aqueous solutions of NaF, NaCl, Nal separately

A. F_2, Cl_2 and I_2 are liberated

B. Only F_2 and Cl_2 are liberated

C. Only I_2 is liberated

D. Only Cl_2 is liberated

Answer: C

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31. What is X, in the reaction?

$$KHSO_4 + F_2 \rightarrow HF + X$$

A. K_2SO_4

B. $K_2S_2O_4$

C. $K_2S_2O_3$

D. $K_2S_2O_8$

Answer: D

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32. The correct order of increasing bond angles in the following species is

A. $ClO_2^- < Cl_2O < ClO_2$

B. $Cl_2O < ClO_2 < ClO_2^-$

C. $ClO_2 < Cl_2O < ClO_2^-$

D. $Cl_2O < ClO_2^- < ClO_2$

Answer: A

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33. When Cl_2 gas reacts with hot and concentrated sodium hydroxide solution, the oxidation number of chlorine changes from

A. zero to +1 and zero to +5

B. zero to -1 and zero to.+5

C. zero to -1 and zero to +3

D. zero to -1 and zero to -3

Answer: B

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34. Among the following which one is wrong-statement?

A. PH_5 and $BiCl_5$ do not exist

B. $p\pi - d\pi$ bonds are present in SO_2

C. SeF_4 and CH_4 have same shope

D. I_3^+ has bent geometry

Answer: C

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35. In which of the following pairs , the two species are not isostructural ? PCl_4^+ and $SiCl_4$, PF_5 and BrF_5, AlF_6^{3-} and SF_6, CO_3^{2-} and NO_3^-

A. PCI_4^+ and $SiCl_4$

B. PF_5 and BrF_5

C. AIF_6^{3-} and SF_6

D. CO_3^{2-} and NO_3^-

Answer: B

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36. In which of the following pairs both the species are not isostructural?

A. Diamond, silicon carbide

B. NH_3, PH_3

C. XeF_4, XeO_4

D. $SiCl_4, PCl_4^+$

Answer: C

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37. Which of the following species has equal number of σ- and π-bonds? (C N) 2 C H 2 (C N) 2 H C O 3- X e O 4

A. $(CN)_2$

B. $CH_2(CN)_2$

C. HCO_3^-

D. XeO_4

Answer: D

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38. Which of the following reactions of xenon compounds is not feasible?

A. $3XeF_4 + 6H_2O \rightarrow 2Xe + Xe + XeO_3 + 12HF + 1.5O_2$

B. $2XeF_2 + 2H_2O \rightarrow 2Xe + 4HF + O_2$

C. $XeF_6 + RbF \rightarrow Rb[XeF_7]$

D. $XeO_3 + 6HF \rightarrow XeF_6 + 3H_2O$

Answer: D

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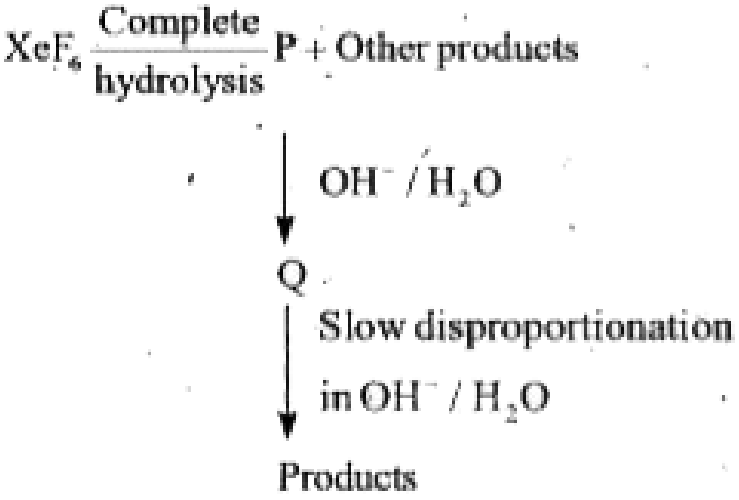
39. Under ambient conditions, the total number of gases released as products in the final step of the reaction scheme shown below is



A. 0

B. 1

C. 2

D. 3

Answer: C

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40. In which of the following arrangements, the order is not correct according to the property indicated against it?

A. $CO_2 < SiO_2 < SnO_2 < PbO_2$: Increasing oxidizing power

B. $HF < HCl < HBr < HI$: Increasing acidic strength

C. $NH_3 < PH_3 < AsH_3 < SbH_3$ Increasing basic strength

D. $B < C < O < N$ Increasing first ionization enthalpy

Answer: C

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41. Which one of the folowing does not have a pyramidal shape?

A. $(CH_3)_3N$

B. $(SiH_3)_3N$

C. $P(CH_3)_3$

D. $P(SiH_3)_3$

Answer: B

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42. The element that has the least tendency to show the inert-pair effect is

A. B

B. P

C. S

D. N

Answer: D

Watch Video Solution

43. $(NH_4)_2Cr_2O_7$ on heating liberates a gas. The same gas will be obtained by

A. heating NH_4NO_2

B. Heating NH_4NO_3

C. treating Mg_3N_2 with H_2O

D. Heating H_2O_2 on $NaNO_2$

Answer: A

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44. N_2 forms NCI_3 whereas P can form both PCl_3 and PCl_5 . Why?

A. P has dorbitals which can be used for bonding but N_2 does not have d orbitals

B. N atom is larger than P in size

C. P is more reactive towards Cl than N

D. The size of N is comparable to Cl while P size is greater than that of CI

Answer: A

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

A. The vapour at 200° C consists mostly of S_8 rings

B. At 600° C the gas mainly consists of S_2 molecules

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

D. S_2 molecule is paramagnetic

Answer: C

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46. The number of S-S bonds in sulphur trioxide trimer, (S_3O_9) is

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47. Hydrolysis of one mole of peroxydisulphuric acid produces

A. two moles of sulphuric acid

B. two moles of peroxymonosulphuric acid

C. one mole of sulphuric acid and one mole of peroxymonosulphuric acid

D. one mole of sulphuric acid, one mole of peroxymonosulphuric acid and one mole of hydrogen peroxide

Answer: A

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48. Identify the incorrect statement among the following

A. Br_2 reacts with hot and strong NaOH solution to give NaBr, $NaBrO_4$ and H_2O

B. Ozone reacts with SO_2 to give SO_3

C. Silicon reacts with NaOH(aq) in the presence of air to give Na_2SiO_3 and H_2O

D. Cl_2 reacts with excess of NH_3 to give N_2 and HCI

Answer: A

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49. Which of the following xenon compounds may not be obtained by hydrolysis of xenon fluorides? X e O 2 F 2 X e O F

4 X e O 3 X e O 4

A. XeO_2F_2

B. $XeOF_4$

C. XeO_3

D. XeO_4

Answer: D

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50. Which one of the following is the correct pair with respect to molecular formula of xenon compound and hybridization state of xenon in it?

A. XwF_4, sp^3

B. XeF_2, sp

C. XeF_2, sp^3d

D. XeF_4, sp^2

Answer: C

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Level Ii

1. What may be expected to happen when phosphine gas is mixed with chlorine gas?

A. PCI_5 and HCl are formed and the mixture cools down

B. PH_3. CI_2 is formed with warming up

C. PCl_3 and HCl are formed and the mixture warms up

D. The mixture only cools down

Answer: A

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2. Sulphur on boiling with NaOH solution gives

A. $Na_2SO_3 + H_2S$

B. $Na_2S_2O_3 + Na_2S$

C. $Na_2S_2O_3 + NaHSO_3$

D. $Na_2SO_3 + SO_2$

Answer: B

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3. At room temperature, H_2O is liquid while H_2S is a gas. The reason is

A. electronegativity of O is greater than S

B. difference in the bond angles of both the molecules

C. association takes place in the H_2O due to H-bonding while no H-bonding in H_2S

D. O and S belong to different periods

Answer: C

Watch Video Solution

4. Iodine is liberated when potassium iodide reacts with a solution of Z n S O 4 C u S O 4 (N H 4) 2 S O 4 N a 2 S O 4

A. $ZnSO_4$

B. $CuSO_4$

C. $(NH_4)_2SO_4$

D. Na_2SO_4

Answer: B

Watch Video Solution

5. The number of P -O- P bonds in the structure of phosphorus pentoxide and phosphorus trioxide are respectively

A. 5,5

B. 6,5

C. 5,6

D. 6,6

Answer: D

Watch Video Solution

6. A substance which gives a yellow precipitate when boiled with an excess of nitric acid and ammonium molybdate and red precipitate with $AgNO_3$ is

A. orthophosphate

B. pyrophosphate

C. metaphosphate

D. hypophosphate

Answer: A

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7. Which one of the following statements regarding helium is incorrect?

A. It is used to produce and sustain powerful superconducting magnets

B. It is used in gas-cooled nuclear reactors

C. It is used to fill gas balloons instead of hydrogen because it is lighter and non-inflammable

D. It is used as a cryogenic agent for carrying out experiments at low temperature

Answer: C

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8. Which of the following statement is wrong?

A. The stability of hydrides increases from NH_3 to BiH_3 in group 15 of the Periodic table

B. Nitrogen can't form $d\pi - P\pi$ bond

C. Single N-N bond is weaker than the single P-P bond

D. N_2O_4 has two resonance structure

Answer: A

Watch Video Solution

9. Conc. HNO_3 stains skin and wool yellow because

A. The skin and wool is burned by acid

B. Nitro cellulose is formed

C. The proteins are converted into xanthoproteins

D. The water is removed by acid

Answer: C

Watch Video Solution

10. Nitrogen reacts with calcium and carbon or when N_2 gas is passed over heated calcium carbide (at 1070 K) it gives ..... Which is an important fertiliser marketed under the name Nitrolium

A. Calcium nitrate

B. Calcium cyanide

C. Calcium cyanamide

D. Calcium nitride

Answer: C

Watch Video Solution

11. NH_3 has pyramidal structure with HNH bond angle of 107°. It forms complexes with cations. Which of the following does not form complex with NH_3?

A. $Ag^{\oplus}$

B. Cu^{2+}

C. Cd^{2+}

D. Pb^{2+}

Answer: D

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12. Ordinary strong solution of HCl, HNO_3 and H_2SO_4 contains roughly

A. 1/5, 2/3 and 3/3 fractions of pure acid and water respectively

B. 2/3, 1/5 and 3/3 fractions of pure acid and water respectively

C. 2/3, 3/3 and 1/5 fractions of pure acid and water respectively

D. 2/3,1/3 and 3/5.fractions of pure acid and water respectively

Answer: A

Watch Video Solution

13. Dilute HNO_3 cannot be concentrated beyond 68% by boiling because

A. On boiling HNO_3 is decomposed

B. On boiling HNO_3 produces a large amount of heat which is uncontrollable

C. It forms a constant boiling mixture with H_2O boiling at 394 K

D. It can be concentrated beyond 68% by steam distillation

Answer: C

Watch Video Solution

14. Paris green was used as a pigment due to unique light green colour but now-a-days it is used as an insecticide. It is prepared by boiling verdigris (basic acetate of copper) arsenious oxide and acetic acid together. It is (C H 3 C O O) 2 C u .3 C u (A s O 2) 2 C u 3 (A s O 4) 2 C u 4 (C H 3 C O O) 2 (A s O 2) 2 C u (O H) 2 .C u 3 A s 2

A. $(CH_3COO)_2Cu.3Cu(AsO_2)_2$

B. $Cu_2(AsO_4)_2$

C. $Cu_4(CH_3COO)_2(AsO_2)_2$

D. $Cu(OH)_2Cu_3As_2$

Answer: A

Watch Video Solution

15. Which one of the following halide does not hydrolyse

A. $SbCl_3$

B. $AsCl_3$

C. PCl_3 and HCl are formed and the mixture warms up

D. NF_3

Answer: D

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16. Following tests are shown by

(i) Decolourisation of acidified soln. of $KMnO_4$

(ii) Liberation of l_2 from an acidified soln. of KI

(iii) On treatment with dil HCl, brown fumes of NO_2

A. Nitrites

B. Nitrates

C. Ammonium salts

D. Methyl amine .

Answer: A

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17. PCl_5 and PH_3 exist but PH_5 does not because

A. $PH_5$is unstable

B. Phosphorous has no vacant orbitals

C. Phosphorous exists as P_4

D. Electro negativity of hydrogen is less as compared to chlorine to excite electron from p orbital to dorbital for bond formation

Answer: D

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18. Holme's signals produce burning gases which serve as a signal to the approaching ships contains

A. A mixture of Ca_3P_2 and CaC_2

B. A mixture of Ca_3P_2 and KOH

C. A mixture of CaC_2 and KOH

D. A mixture of Ca_3P_2, CaC_2 and KOH

Answer: A

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19. If phosphorous acid is allowed to react with excess of KOH, the product obtained is

A. K_3PO_3

B. $KH_2H_2PO_3$

C. K_2HPO_3

D. $KHPO_3$

Answer: C

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20. When NH_4 OH is added to copper sulphate solution, blue colour is obtained due to formation of

A. $Cu(NH_3)_4SO_4$

B. $Cu(NH_3SO_4)_2$

C. $Cu(OH)_2$

D. CuO

Answer: A

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21. The number of P-O-P and P-OH bonds present respectively in pyrophosphoric acid molecule are

A. 2,3

B. 1,8

C. 1,4

D. 1,2

Answer: C

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22. When ammonia is heated with CO_2 under pressure, the product is

A. $(NH_4)_2CO_3$

B. NH_2CONH_2

C. NH_2COONH_4

D. Nh_4HCO_3

Answer: B

Watch Video Solution

23. White phosphorus reacts with caustic soda. The products are PH_3 and NaH_2PO_2. This reaction is an example of

A. Oxidation

B. Reduction

C. Neutralisation

D. Disproportionation

Answer: D

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24. Nitrogen molecule is chemically less active because of its

A. Small dissociation energy

B. High dissociation energy

C. High electronegativity

D. Stable electronic configuration

Answer: B

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25. PCl_5 is kept in well stoppered bottles because

A. It is highly volatile

B. It reacts readily with moisture

C. It reacts with oxygen

D. It is explosive

Answer: B

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26. The BCl_3 is a planar molecule whereas NCl_3 is pyramidal because

A. N-Cl bond is more covalent than B-Cl bond

B. B-Cl bond is more polar than N-Cl bond

C. Nitrogen atom is smaller than boron

D. BCI_3 has no lone pair but NCl_3, has a lone pair of electron

Answer: D

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27. Hydrolysis of NCl_3 gives NH_3 and X. Which of the following is X?

A. $HClO_4$

B. $HClO_3$

C. $HOCl$

D. $HClO_2$

Answer: C

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28. Atoms in P_4 molcule of white phosphorus are arranged regularly in the following way:

A. At the corners of a cube

B. At the corners of an octahedron

C. At the comers of a tetrahedron

D. At the centre and corners of a tetrahedron

Answer: C

Watch Video Solution

29. One mole of H_3PO_3 on reaction with excess of NaOH gives:

A. one mole of Na_2HPO_3

B. two moles of $Na_2H_2PO_3$

C. two moles of Na_2HPO_3

D. one mole of Na_3PO_3

Answer: A

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30. If O_2 is removed from the formula of anhydride of HNO_2 , their the formula of the resulting compound satisfies which of the following properties?

A. It produces tears in eyes

B. It supports combustion

C. It is paramagnetic

D. It cannot react with red hot copper

Answer: B

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31. Which of the following is correct?

A. N_2O is a laughing gas and is angular in shape

B. NO_2 is a sweet smelling and is angular in shape

C. $NO_2$is a colourless gas and acidic in nature

D. NO_2 on reaction with NaOH gives a mixture of two salts

Answer: D

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32. The oxyacid of phosphorus in which phosphorus has the lowest oxidation state is:

A. hypophosphorus acid

B. orthophosphoric acid

C. pyrophosphoric acid

D. metaphosphoric acid

Answer: A

Watch Video Solution

33. How many peroxy linkages are present in pyrophosphric acid?

A. 0

B. 1

C. 2

D. 3

Answer: A

Watch Video Solution

34. Which of the following options are true (T) and which are false (F) ?

(i) Ionic mobility is the highest for I^- in water as compared

to other halides

(ii) Stability order is: $Cl_3^- > Br_3^- > I_3^-$

(iii) Reactivity order is: $F < Cl < Br < I$

(iv) Oxidizing power order is: $F_2 < Cl_2 < Br_2 < I_2$

A. TFTF

B. TFFF

C. TFFT

D. FTFT

Answer: B

Watch Video Solution

35. Which of the following series of fluorides is known?

A. XwF_2, XeF_4, XeF_3

B. XeF_2, XeF_4, XeF_6

C. XeF_2, XeF_3, XeF_6

D. XeF_2, XeF_4, XeF_5

Answer: B

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36. The compounds of S obtained by reaction of S and conc. hot KOH when reacted separately with dil. HCI produce

A. different gases, SO_2 and H_2S

B. same gas SO_2

C. S is obtained back

D. same gas H_2S

Answer: A

Watch Video Solution

37. Which of the following pseudohalides does not form dimer like halogen X_2 ?

A. CN^-

B. SCN^-

C. $SeCN^-$

D. OCN^-

Answer: D

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38. Which blue-liquid is obtained on reacting equimolar amounts of two gases at $-30^{\circ}C$? N 2 O N 2 O 3 N 2 O 4 N 2 O 5

A. N_2O

B. N_2O_5

C. N_2O_4

D. N_2O_5

Answer: B

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39. Select correct statement.

(i) Mixture of NH_4Cl and $NaNO_2$ on heating gives N_2 gas .

(ii) CFC is used as refrigerating fluid and as propellant in aerosols

(iii) Phosgene is formed when P_4 reacts with NaOH

(iv) Phosgene dissolves in water forming P_2O_5

A. i and ii

B. ii and iii

C. iii and iv

D. I only

Answer: A

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40. The true statement for the acids of phosphorus, 'H3PO2, H3PO3 and H3PO4 ' is

A. their acidic nature is: $H_3PO_4 < H_3PO_3 < H_3PO_2$

B. all of them are reducing in nature

C. all of them are tribasic acids

D. the geometry is tetrahedral in all the three

Answer: D

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41. $NH_4Cl(s)$ is heated in a test tube. Vapours are brought in contact with red litmus paper, which changes to blue and then to red. It is because of

A. formation of NH_3OH and HCI

B. formation of NH_3 and HCI

C. greater diffusion of NH_3 than HCI

D. greater diffusion of HCl than N_3

Answer: C

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42. The thermal stability of hydrides of oxygen family is in order :

A. $H_2Po < H_2Te < H_2Se < H_2S < H_2O$

B. $H_2Po < H_2O < H_2Te < H_2Se < H_2S$

C. $H_2S < H_2O < H_2Te < H_2Se < H_2Po$

D. $H_2OH_2 < H_2Te < H_2Se < H_2Po$

Answer: A

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43. Which of the following can convert acidified $Cr_2O_7^{2-}$ to green? $SO_2 / H_2SO_3 / H_2SO_4$, $SO_3 / H_2SO_3 / H_S$, $SO_3^{2-} / H_2S / Fe^{2+}$, $S_2O_3^{2-} / SO_3 / Fe^{3+}$

A. $SO_2 / H_2SO_3 / H_2SO_4$

B. $SO_3 / H_2SO_3 / H_2S$

C. $SO_3^{2-} / H_2S / Fe^{2+}$

D. $S_2O_3^{2-} / SO_3 / Fe^{3+}$

Answer: C

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44. Bleaching of a fabric cloth is done using Aand excess of chlorine is removed using B. A and B are respectively. C a O C l 2 , N a 2 S O 3 N a 2 S 2 O 3 , C a O C l 2 C a C l 2 , N a 2 S 2 O 3 C a (O C l) 2 , N a 2 S 2 O 3

A. $CaOCl_2, Na_2SO_3$

B. $Na_2S_2O_3, CaOCl_2$

C. $CaCl_2, Na_2S_3O_3$

D. $Ca(Ocl)_2, Na_2S_2O_3$

Answer: D

Watch Video Solution

45. Select incorrect statement

A. ClO_2 and Cl_2O are used as bleaching agents for paper pulp and textiles

B. OCl^- (hypohalites) salts are used as detergent

C. OCl^- disproportionates in alkaline medium

D. BrO_3^- is oxidised to Br_2 by Br in acidic medium

Answer: B

Watch Video Solution

46. Which of the underlined atoms in oxyacids have sp^3 hybridised atoms?

A. $HClO_4, H_2SO_4, HNO_2$

B. H_2SO_4, H_3PO_4, HNO_3

C. $HClO_4, H_2SO_4, H_2SO_3$

D. $HClO_4, HNO_3, HClO_3$

Answer: C

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47. In the preparation of HBr or HI, NaX (X=Br, I) is treated with H_3PO_4 and not by conc. H_2SO_4 and since

A. H_2SO_4 makes the reaction reversible

B. H_2SO_4 oxidises HX to $X_2(Br, I)$

C. Na_3PO_4 is water soluble

D. Na_2SO_4 is water soluble

Answer: B

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48. Cl_2O, Br_2O, I_2O have positive value of ΔG (free energy) indicating that

A. these oxides are stable

B. these oxides are unstable and changes to X_2 and O_2

C. these disproportionate into X^- and XO^-

D. these oxides can form interhalogen compounds

Answer: B

Watch Video Solution

Watch Video Solution

49. Select correct statements:

A. Helium has the lowest melting point and boiling point

B. Helium can diffuse through rubber, PVC and even glass

C. Ar, Krand Xe form clathrate

D. All the above are correct statements

Answer: D

Watch Video Solution

50. Basic character of fluorides increases in the order X e F 6 < X e F 4 < X e F 2 X e F 2 < X e F 4 < X e F 6 X e F 2 = X e F 4 < X e F 6 X e F 2 > X e F 4 < X e F 6

A. $XeF_6 < XeF_4 < XeF_2$

B. $XeF_2, < XeF_4 < XeF_6$

C. $XeF_2 = XeF_6$

D. $XeF_2 > XeF_4 < XeF_6$

Answer: A

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Level Iii

1. Which of the following is the correct statement

A. Between NH_3 and PH_3NH_3, is a better electron donor because the lone pair of electrons occupies

spherical s-orbital and is less directional

B. Between NH_3 and PH_3, PH_3 is a better electron donor because the lone pair of electrons occupies sp^3 orbital and is more directional.

C. Between NH_3 and PH_3, NH_3 is a better electron donor because the lone pair of electrons occupies sp^3 orbital and is more directional.

D. Between NH_3 and PH_3, PH_3 is a better electron donor because the lone pair of electrons occupies spherical s-orbital and is less directional.

Answer: C

Watch Video Solution

2. A dark brown solid (X) reacts with NH_3 to form a mild explosive which decompuses to give a violet coloured gas(X)also reacts with H_2 to give an acid (Y). (Y) can also be prepared by heating its salt with H_3PO_4.X and Y are

A. Cl_2, HCl

B. SO_2, H_2SO_4

C. Br_2HBr

D. I_2, HI

Answer: D

Watch Video Solution

3. Which of the following formulae represents peroxodisulphuric acid?

A. $H-O-O-\overset{\underset{O}{\|}}{\underset{O}{\|}}{S}-O-\overset{\underset{O}{\|}}{\underset{O}{\|}}{S}-OH$

B. $H-O-O-\overset{\underset{O}{\|}}{\underset{O}{\|}}{S}-O-\overset{\underset{O}{\|}}{\underset{O}{\|}}{S}-O-O-H$

C. $H-O-\overset{\underset{O}{\|}}{\underset{O}{\|}}{S}-O-O-\overset{\underset{O}{\|}}{\underset{O}{\|}}{S}-OH$

D. $H-O-O-\overset{\underset{O}{\|}}{\underset{O}{\|}}{S}-\overset{\underset{O}{\|}}{\underset{O}{\|}}{S}-OH$

Answer: C

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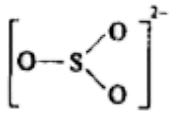
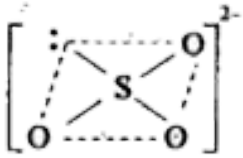
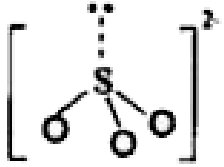
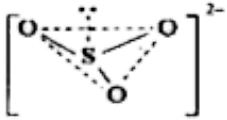
4. The structure of SO_3^{2-} is

A. 

B. 

C. 

D. 

Answer: C

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5. The products obtained when iodine reacts with hot and concentrated solution of sodium hydroxide are

A. $I^- + IO^-$

B. $I^- + IO_3^-$

C. CL_2, H_2

D. H_2, Cl_2

Answer: B

Watch Video Solution

6. A gas “X” is passed through water to form a saturated solution. The aqueous solution on treatment with silver nitrate gives a white precipitate. The saturated aqueous solution also dissolves magnesium ribbon with evolution of colourless gas "Y". The X and Y respectively, are

A. CO_2, Cl_2

B. Cl_2, CO_2

C. Cl_2, H_2

D. H_2Cl_2

Answer: C

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7. Which of the following statements regarding interhalogens is not correct?

A. Interhalogens involvecovalent bonding

B. Interhalogens are less reactive than halogens

C. $(ICI_3)_2$ in liquid from shows enhanced conductivity

D. Interhalogens of the formula AX_4 are not observed

Answer: B

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8. In a sealed nickel vessel, Xe and F_2 were taken in 1:20 volume ratio and they were heated to 400° C. The product obtained is

A. XeF

B. XeF_2

C. XeF_4

D. XeF_6

Answer: D

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9. The acidic strength of oxoacids of chlorine is in the order 'HClO4,HClO3,HClO2,HClO' Briefly explain the reason for this.

A. $HOCl < HClO_2 < HClO_3 < HClO_4$

B. $HClO_4 < HClO_3 < HClO_2 < HOCl$

C. $HClO_3 < HClO_4 < HClO_2 < HOCl$

D. $HClO_2 < HClO_3 < HOCl < HClO_4$

Answer: A

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10. Select correct statement(s).

A. Cl_2O and ClO_2 are used as bleaching agents and as germicides

B. I_2O_5 is used in the quantitative estimation of CO

C. Bond angle XOX varies in the order, FOF $<$ ClOCl $<$ BrOBr

D. All of the above are correct statements

Answer: D

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11. Which of the following orders are incorrect?

A. $H_3PO_4 > H_3PO_3 > H_3PO_2$ (reducing character)

B. $SbH_3 > NH_3 > AsH_3 > PH_3$ (reducing character)

C. $NH_3 > PH_3 > ASH_3 > SbH_3$ (basicity)

D. $N_2O < NO < N_2O_3 < N_2O_5$ (oxidation state of nitrogen atom)

Answer: A::B

Watch Video Solution

12. Which of the following statements are not correct?

A. Only chlorine and bromine form oxy acids

B. All halogens form oxyacids

C. Only iodine forms oxy acids

D. All halogens, except fluorine, form oxy acids

Answer: A::B::C

Watch Video Solution

13. Which statements are correct?

A. Electronegativity of fluorine is maximum

B. Electron affinity of fluorine is maximum

C. Melting point of fluorine is minimum in its group

D. Boiling point of fluorine is maximum in its group

Answer: A::C

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14. The nitrogen containing compound produced in the reaction of HNO_3 with P_4O_{10}

A. can be prepared by reaction of P_4 and HNO_3

B. is diamagnetic

C. contains N-N bond

D. reacts with Na-metal producing brown gas

Answer: B::D

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15. A solution of colourless salt Honboiling with excess NaOH produces a non-flammable gas. The gas evolution ceases after sometime. Upon addition of Zn dust to the same

solution, the gas evolution restarts. The colourless salt(s) II is (are)

A. NH_4NO_3

B. NH_4NO_2

C. NH_2Cl

D. $(NH_4)_2SO_4$

Answer: A::B

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16. The correct statement(s) about O_3 is (are)

A. O-O bond length are equal

B. thermal decomposition of O_3 is endothermic

C. O_3 is diamagnetic in nature

D. O_3has a bent structure

Answer: A::C::D

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17. Which of the following hydrogen halides react(s) with $AgNO_3$ (aq) to give a precipitate that dissolves in $Na_2S_2O_3$ (aq)

A. HCl

B. HF

C. HBr

D. HI

Answer: A::C::D

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18. The correct statement(s) regarding (i) HClO, (ii) $HClO_2$, (iii) $HClO_3$and (iv) $HClO_4$, is (are)

A. The number of Cl=O bonds in (ii) and (iii) together is two

B. The total number of lone pairs of electrons on Cl in (ii) and (iii) together is three

C. The hybridization of Cl in (iv)as sp^3

D. Amongst (i) to (iv), the strongest acid is (i)

Answer: B::C

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19. The nitrogen oxide(s) that contains(s) N-N bond(s) is (are)

A. N_2O

B. N_2O_3

C. N_2O_4

D. N_2O_5

Answer: A::B::C

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20. Which of the following statements are incorrect?

A. Solid PCl_5 exists as tetrahedral $[PCl_4]^+$ and octahedral $[PCl_6]^+$ ions.

B. Oxides of phosphorus, P_2O_3 and P_2O_3 exist as monomers.

C. Solid PCl_5 exists as $[PCI_4]^+CI^-$

D. Solid N_2O_5 exists as $NO_2^+NO_3^-$

Answer: B::C

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21. Which of the following reactions are feasible?

A. $Cl_2 + 2Br^- \rightarrow 2Cl^- + Br_2$

B. $Br_2 + 2F^- \rightarrow 2Br^- + F_2$

C. $I_2 + 2Br^- \rightarrow 2I^- + Br_2$

D. $F_2 + 2Br^- \rightarrow 2F^- + Br_2$

Answer: A::D

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22. The noble gases which are lighter than air are

A. Ar

B. He

C. Ne

D. Kr

Answer: B::C

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23. Among the following, the number of compounds that can react with PCl_5 to give $POCI_3$ is

O_2, CO_2, SO_2, H_2O, H_2SO_4, P_4O_{10}

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24. Ozone reacts with dry iodine to form an oxide having ..... Oxygen atoms in its molecules.

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25. In the interhalogen compound AB_n what is the maximum value of n?

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26. Chlorine water on cooling deposits greenish yellow crystals of formula Cl_2xH_2O. What is the value of x?

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27. How many dpi-ppi bonds are there in XeO_4?

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28. This section contains questions each with two columns-I and II. Match the items given in column I with that in column

II.

Column I (Property of SO_2)	Column II (Reaction)
A. Acidic nature	p. $SO_2 + 2H_2O \rightarrow H_2SO_4 + 2[H]$
B. Oxidising nature	q. $CaO + SO_2 \rightarrow CaSO_3$
C. Reducing nature	r. $2H_2S + SO_2 \rightarrow 3S + 2H_2O$
D. Bleaching action	s. $Cr_2O_7^{2-} + 2H^{\oplus} + 3SO_2 \rightarrow 3SO_4^{2-} + H_2O + 2Cr^{3+}$

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29. Match the following columns

Column I	Column II
A. $Cu + dil\ HNO_3$	p. NO
B. $Cu + conc\ HNO_3$	q. NO_2
C. $Zn + dil\ HNO_3$	r. N_2O
D. $Zn + conc\ HNO_3$	s. $Cu(NO_3)_2$
	t. $Zn(NO_3)_2$

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30. Match the following columns

Column I	Column II
A. XeF_2	p. Square pyramidal
B. $XeOF_4$	q. Linear
C. XeF_4	r. Distorted octahedral
D. XeF_6	s. Square planar
E. XeO_4	t. Pyramidal
F. XeO_3	u. Tetrahedral

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31. Match the following columns

Column I	Column II
A. $(CH_3)_2SiCl_2$	p. Hydrogen halide formation
B. XeF_4	q. Redox reaction
C. Cl_2	r. Reacts with glass
D. VCl_5	s. Polymerization
	t. O_2 formation

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32. Match the following columns

Column I	Column II
A. $H_3PO_3 \xrightarrow{\Delta}$	p. Gives highly explosive solid
B. $XeF_6 + 6H_2O \rightarrow$	q. One of the products is a tribasic non-reducing acid
C. $NO_2 + H_2O \rightarrow$	r. Dehydration
D. $HNO_3 + P_4O_{10} \xrightarrow{\Delta}$	s. In one of the products, central atom has (+5) oxidation state

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33. Statement 1 : Xenon fluorides are well known and stable but the corresponding chlorides have not been reported. Statement 2: Xe-F bond is more strong than Xe-Cl bond and F_2 molecule has low bond dissociation energy than that of Cl_2 molecule.

A. Statement 1 is True, Statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement I is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement I.

C. Statement I is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: A

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34. Statement 1 : Fatom has a less negative electron gain enthalpy than Clatom. Statement 2 : Additional electrons are repelled more effectively by 3p electrons in Clatom than by 2p electrons in F-atom.

A. Statement 1 is True, Statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement I is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement I.

C. Statement I is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: C

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35. Assertion : Fluorine combines with sulphurto form SF_6 but no other halogen forms hexahalide wth sulphur.

Reason The reactivity of halogens increases as the atomic number increases.

A. Statement 1 is True, Statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement I is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement I.

C. Statement I is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: C

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36. Assertion : On cooling, the brown colour of nitrogen dioxide disappears.

Reason : On cooling, NO_2 undergoes dimerisation resulting in the pairing of odd electron of NO_2

A. Statement 1 is True, Statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement I is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement I.

C. Statement I is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: A

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37. Assertion : Elementary phosphorus exists in three principal allotropic forms, i.e., white (yellow), red (or violet) and black.

Reason : Of the three forms, white phosphorus is the most important and most reactive.

A. Statement 1 is True, Statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement I is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement I.

C. Statement I is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: B

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38. Statement 1 : Solubility of noble gases in water decreases with increase in atomic size. Statement 2 : Solubility of noble gases in water is due to instantaneous dipole-induced dipole interaction.

A. Statement 1 is True, Statement 2 is True, Statement 2 is Correct explanation for Statement 1.

B. Statement I is True, Statement 2 is True, Statement 2 is NOT a correct explanation for Statement I.

C. Statement I is True, Statement 2 is False.

D. Statement 1 is False, Statement 2 is True.

Answer: D

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39. The pronounced change from non-metallic to metallic behaviour and also increase in the basicity of oxides from nitrogen to bismuth in group 15 is principally due to increasing size of the atoms. The ionisation potential of nitrogen is very high on account of its small size. However, ionisation potential decreases regularly on descending the group.

Which one of the following is a strongest base?

A. AsH_3

B. SbH_3

C. PH_3

D. NH_3

Answer: D

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40. The pronounced change from non-metallic to metallic behaviour and also increase in the basicity of oxides from nitrogen to bismuth in group 15 is principally due to increasing size of the atoms. The ionisation potential of nitrogen is very high on account of its small size. However, ionisation potential decreases regularly on descending the group.

Which of the following fluorides does not exist?

A. NF_5

B. PF_5

C. AsF_5

D. SbF_5

Answer: A

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41. The pronounced change from non-metallic to metallic behaviour and also increase in the basicity of oxides from nitrogen to bismuth in group 15 is principally due to increasing size of the atoms. The ionisation potential of nitrogen is very high on account of its small size. However, ionisation potential decreases regularly on descending the group.

In all the group 15 elements, the number of unpaired electrons in the valence shell is:

A. 4

B. 3

C. 2

D. 5

Answer: B

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42. Sulphuric acid is considered as the king of chemicals: The prosperity of any country is measured by the amount of sulphuric acid it consumes. Sulphuric acid is, thus, a substance of very great commercial importance as it is used practically in every important industry. This is due to the following properties of sulphuric acid: a) acidic nature b)oxidising nature c) dehydrating nature - d) sulphonation

Which of the following reactions depict the oxidising behaviour of H_2SO_4?

A. $2HI + H_2SO_4 \rightarrow I_2 + SO_2 + 2H_2O$

B. $NaCl + H_2SO_4 \rightarrow NaHSO_4 + HCl$

C. $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$

D. $2PCl_5 + H_2SO_4 \rightarrow 2POCl_3 + 2HCl + SO_2Cl_2$

Answer: A

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43. Sulphuric acid is considered as the king of chemicals: The prosperity of any country is measured by the annount of sulphuric acid it consumnes. Sulpliuric acid is, thus, a substance of very great commercial importance as it is used practically in every important industry. This is due to the following properties of sulphuric acid: a) acidic nature

b)oxidising nature c) dehydrating nature - d) sulphonation

Sulphuric acid is used:

A. in Iead storage batteries

B. in making fertilizers

C. in making explosives

D. in all of these

Answer: D

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44. Sulphuric acid is considered as the king of chemicals: The prosperity of any country is measured by the annount of sulphuric acid it consumnes. Sulpliuric acid is, thus, a substance of very great commercial importance as it is used

practically in every important industry. This is due to the following properties of sulphuric acid: a) acidic nature b)oxidising nature c) dehydrating nature - d) sulphonation

Concentrated H_2SO_4cannot be used to prepare HBr or HI from KBr or KI because it:

A. reacts too slowly with KBr or KI

B. reduces HBr or HI

C. oxidises HBror HI

D. oxidises KBr to $KBrO_3$ or KI to KIO_3

Answer: C

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45. A salt (A) when heated with $K_2Cr_2O_7$ and conc. H_2SO_4 liberates a gas which is absorbed in NaOH solution. The NaOll solution turns yellow. When this solution is acidified with acetic acid and lead acetate solution is added, a yellow precipitate (B) is formed. The acid radical present in the salt is

A. NO_3^-

B. Cl^-

C. S^{2-}

D. I^-

Answer: B

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46. A salt (A) when heated with $K_2Cr_2O_7$ and conc. H_2SO_4 liberates a gas which is absorbed in NaOH solution. The NaOll solution turns yellow. When this solution is acidified with acetic acid and lead acetate solution is added, a yellow precipitate (B) is formed. (A) is mixed with MnO_2 and heated with conc. H_2SO_4 when a gas (C) is evolved which tums starch-iodide paper blue.

The compound formed, which turns NaOH solution yellow, is:

A. $Na_2Cr_2O_7$

B. Na_2S

C. Nal

D. Na_2CrO_4

Answer: D

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47. A salt (A) when heated with $K_2Cr_2O_7$ and conc. H_2SO_4 liberates a gas which is absorbed in NaOH solution. The NaOll solution turns yellow. When this solution is acidified with acetic acid and lead acetate solution is added, a yellow precipitate (B) is formed. (A) is mixed with MnO_2 and heated with conc. H_2SO_4 when a gas (C) is evolved which tums starch-iodide paper blue.

What is the colour of gas which is evolved when salt (A) is heated with MnO_2 and H_2SO_4?

A. violet

B. brown

C. greenish yellow

D. colourless

Answer: C

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48. The noble gases have closed-shell electronic configuration and are monoatomic gases under normal conditions. The low boiling points of the lighter noble gases are due to the weak dispersion forces between the atoms and the absence of other interatomic interactions, The direct reaction of xenon with fluorine leads to a series of compounds with oxidation numbers +2, 4 and +6, XeF_4 reacts violently with water to give XeO_3. The compouds of xenon exhibit rich stereochemistry and their geometries can be deduced considering the total number of electron pairs in the valence shell.

Argon is used in arc welding because of its

A. low reactivity with metals

B. ability to lower the melting point of metals

C. flammability

D. high calorific value

Answer: A

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49. The structure of XeO_3 is

A. linear

B. planar

C. pyramidal

D. T-shaped

Answer: C

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50. XeF_4 and XeF_6 are expected to be

A. oxidising

B. reducing

C. unreactive

D. strongly basic

Answer: A

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