CHEMISTRY

BOOKS - PRADEEP CHEMISTRY (HINGLISH)

P-BLOCK ELEMENTS (NITROGEN FAMILY)

Curiosity Question

1. How do the airbags installed in the dashboard of your car work ?

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Test Your Grip Multiple Choice Questions I

1. Which of the following does not form a pentachloride?

A. P

B. As

C. Sb

D. N

Answer: A::B::C::D

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2. Which of the following on heating does not given nitrogen gas?

A. NH_4NO_3

B. NH_4NO_2

C. $Ba(N_3\ \_\ (2)$

D. $(NH_4)_2Cr_2O_1$

Answer: A::B::C::D

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3. The element which forms oxides in all oxidation states $+1$ to $+5$ is.

A. N

B. P

C. As

D. Sb

Answer: A

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4. Which of the following elements is kept in water?

A. White P

B. Na

C. S

D. Si

Answer: A::C

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5. For H_3PO_3 and H_3PO_4 the correct choice is

A. H_3PO_3 is dibasic and reducing

B. H_3PO_4 is dibasic and non-reducing

C. H_3PO_4 is tribasic and reducing

D. H_3PO_3 is tribasic and non-reducing

Answer: A

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6. Which of the following is arranged in the increasing order of enthalpy of vaporization?

A. NH_3, PH_3, AsH_3

B. AsH_3, PH_3, NH_3

C. NH_3, AsH_3, PH_3

D. PH_3, AsH_3, NH_3

Answer: A::C

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7. The number of $P-O-P$ bridge in the structure of phosphorous pentoxide and phosphorus trioxide are respectively

A. 6,6

B. 5,5

C. 5,6

D. 6,5

Answer: A

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Test Your Grip Ii Fill In The Blanks

1. Nitrogen does not form pentahlides as it does not have .....

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2. Conc. HNO_3 on dehydration with P_4O_{10} gives.....

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3. Aqua regia is

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4. In gaseous state, nitric oxide is ..... While in the liquid or solid state it is ..... .

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5. The formula of acidic nitrogen hydride is ..... .

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6. Nitric acid contaning ..... Is called fuming nitric acid.

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7. Laughing gas is obtained when a mixture of NH_4Cl and .....is heated while nitrogen gas is obtained when a mixture of NH_4Cl and .....is heated.

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8. In the ring test of NO_3^- ion, Fe^{2+} ion reduces nitrate ion to nitric oxide, which combines with Fe^{2+} (aq) ion to form brown complex . Write the reactions involved in the formation of brown ring.

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9. The products of oxidation of phosphorus acid by hot concentrated sulphuric acid are .....and ..... .

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10. The P-P-P angle in P_4 molecule is .....degree while S-S-S angle in S_8 is .....degree.

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11. The molecule of PCl_5 in the solid state is .....in nature consisting of tetrahedral .....cation and octahedral.....anion.

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12. .....is obtained when yellow phosphorus is heated with an aqueous solution of NaOH in an inert atmosphere.

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13. .....and.....are neutral oxides of nitrogen.

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14. As_2O_5 is .....while Sb_2O_5 is..... .

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15. Red phosphorus is .....reactive than white phosphorus as red phosphorus is polymeric and consists of ..... the of P_4 units.

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Conceptual Questions

1. PCl_5 is known but NCl_5 is not known.

Or Nitrogen does not form pentahalide.

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2. Explain the difference between covalency and oxidation state by taking the example of N_2O_5.

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3. The stability of $+5$ oxidation state decreases down the group 15 of the periodic table.Explain this observation giving appropriate reasons.

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4. Tendency to form pentahalides decreases down the group 15 of the periodic table. Account for this observation.

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5. Give the chemical reaction to support that $+5$ oxidation state of Bi is less stable than $+3$ state.

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6. Bismuth is a strong oxidizing agent in the pentavalent state. Or pentavalent bismuth is a strong oxidizing agent.

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7. Why is Bi(V) a stronger oxidant than Sb(V) ?

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8. Explain why both N and Bi do not form pentahalides while phosphorus does.

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9. NH_3 has higher proton affinity than PH_3. Explain. Or NH_3 is more basic than PH_3.

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10. You have the following substances : $NH_3, O_2,$ and H_2O. Write equations for the preparation N_2O from these substances.

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11. Although nitrogen and chlorine have very nearly same electronegativity yet nitrogen forms hydrogen bonding while chlorine does not. Why?

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12. Although fluorine is much more electronegative than hydrogen yet the dipole moment of NF_3 (0.24 D) is much lower than that of NH_3 (1.46 D). Explain.

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13. Unlike phosphorus, nitrogen show little tendency for catenation.

Or Phosphorus shows greater tendency for catenation than nitrogen.

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14. Ammonia is a good complexing agent. Give reasons.

Or Ammonia acts as a ligand. Explain.

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15. Why is N_2O_5 more acidic than N_2O_3 ?

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16. Give reasons for the following :

(i) NO (Nitric oxide) is paramagnetic in the gaseous state but diamagnetic

in the liquid and solid states. Why?

(ii) Nitric oxide becomes brown when released in air.

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17. In the structure of HNO_3, why is N-O bond (121 pm) shorter than N-OH bond (140 pm) ?

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18. Why is nitrous acid oxidant as well as reductant?

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19. Draw the structure of white phosphorus and red phosphorus. Which one of these two types of phosphorus, is more reactive and why ?

Or Which allotrope of phosphorus is more reactive and why?

Or Why is red phosphorus less reactive than white phosphorus.

Or Draw the structural difference between white and red phosphorus.

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20. PCl_5 is ionic in nature in the solid state. Give reasons.

Or Solid phosphorus pentachloride behaves as an ionic compound. Explain.

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21. Draw the structure of PCl_5.

Or Solid PCl_5 is ionic in nature.

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22. Given chemical reaction in support of the statement that all the bonds in PCl_5 molecule are not equivalent.

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23. H_3PO_3 is diprotic (or dibasic). Why ?

Or What is the basicity of H_3PO_3 and why ?

Or Draw the structure of dibasic oxoacid of phosphour.

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24. H_3PO_3 undergoes disproportionation reaction but H_3PO_4 does not ? Explain.

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Ncert Questions And Exercises With Answers Ncert Intext Solved Questions

1. Though nitrogen exhibits +5 oxidation state, it does not form pentahalide. Give reason.

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2. PH_3 has lower boiling point that NH_3. Why ?

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3. Write the reaction of thermal decomposition of sodium azide.

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4. Why does NH_3 act as a Lewis base ?

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5. Why does NO_2 dimerise ?

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6. In what way can it be proved that PH_3 is basic in nature ?

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7. Why does PCl_3 fume in moisture ?

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8. Are all the five bonds in PCI_5 equivalent ? Justify.

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9. How do you account for the reducing behaviour of H_3PO_2 ?

Or (i) Draw the structure of phosphinic aicd (H_3PO_2).

(ii)Write a chemical reaction for its use as a reducing agent.

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Ncert Questions And Exercises With Answers Ncert Intext Unsolved Questions

1. Why are pentahalides more covalent than trihalides?

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2. Why is BiH_3 the strongest reducing agent amongst all the hydrides of group 15 elements ?

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3. Why is N_2 less reactive at room temperature ?

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4. Mention the conditions to maximise the yield of ammonia.

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5. How does ammonia react with a solution of Cu^{2+} ?

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6. What is the covalence of nitrogen in N_2O_5?

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7. Bond angle in PH_4^+ is higher than that in PH_3.Why ?

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8. What happens when white phosphrous is heated with concetrated NaOH solution in an inert atmosphere of CO_2 ?

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9. What happens when PCl_5 is heated ?

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10. Write a balanced equation for the hydrolytic reaction of PCl_5 in heavy water.

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11. What is the basicity of H_3PO_4 ?

Watch Video Solution

12. What happens when H_3PO_3 is heated ?

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Ncert Questions And Exercises With Answers Ncert Exercies

1. Discuss the general characteristics of Group 15 elements with reference to their electronic configuration, oxidation state, atomic size, ionisation enthalpy and electronegativity.

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2. Why does the reactivity of nitrogen differ from phosphorus?

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3. Discuss the trends in chemical reactivity of group 15 elements.

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4. Why does NH_3 form hydrogen bond but PH_3 does not?

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5. How is nitrogen prepared in the laboratory? Write the chemical equations of the reactions involved.

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6. How is ammonia manufactured industrially?

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7. Illustrate how copper metal can give different products on reaction with HNO_3.

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8. Give the resonating structures of NO_2 and N_2O_5.

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9. The HNH angle value is higher than HPH, HAsH and HSbH angles. Why?

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10. Why does $R_3P=O$ exist but $R_3N=O$ does not (R is an alkyl group)?

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11. Explain why NH_3 is basic while BiH_3 is only feebly basic ?

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12. Nitrogen exists as diatomic molecule and phosphorus as P_4. Why ?

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13. Write main differences between the properties of white phospghorus and red phosphorus.

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14. Why does nitrogen show catenation properties less than prosphorus.

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15. Give the disproportionation reaction of H_3PO_3.

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16. Can PCl_5 act as oxidising as well as reducing agent ? Justify.

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Ncert Exemplar Problems With Answers Hints And Solutions Multiple Choice Questions I

1. In qualitative analysis when H_2S is passed through an aqueous solution of salt acidified with dil. HCl, a black precipitate is obtained. On boiling the precipitate with dil. HNO_3, it forms a solution of blue colour. Addition of excess of aqueous solution of ammonia to this solution gives

A. deep blue precipitate of $Cu(OH)_2$

B. deep blue solution of $\left[Cu(NH_3)_4\right]^{2+}$

C. deep blue solution of $Cu(NO_3)_2$

D. deep blue solution of $Cu(OH)_2.\ Cu(NO_3)_2$

Answer: B

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2. In a cyclotrimetaphosphoric acid molecule, how many single and double bonds are present ?

A. 3 double bonds , 9 single bonds

B. 6 double bonds , 6 single bonds

C. 3 double bonds , 12 single bonds

D. Zero double bonds , 12 single bonds

Answer: A

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3. Which of the following elements can be involved in $p\pi - d\pi$ bonding?

A. Carbon

B. Nitrogen

C. Phosphorus

D. Boron

Answer: C

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4. Which of the following pairs of ions are isoelectronic and isostructural ?

A. CO_3^{2-}, NO_3^-

B. ClO_3^-, CO_3^{2-}

C. SO_3^{2-}, NO_3^-

D. ClO_3^-, SO_3^{2-}

Answer: A

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5. Bond dissociation enthalpy of E-H(E= element) bonds is given below. Which of the compounds will act as strongest reducing agent

Compound	NH_3	PH_3	AsH_3	SbH_3
$\Delta_{diss}(E-H)/kJmol^{-1}$	289	322	279	255

A. NH_3

B. PH_3

C. AsH_3

D. SbH_3

Answer: D

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6. On heating with concentrated NaOH solution in an inert atmosphere of CO_2, white phosphorus gives a gas. Which of the following statements is incorrect about the gas ?

A. It is highly poisonous and has smell like rotten fish

B. It's solution in water decomposes in the presence of light

C. It is more basic than NH_3

D. It is less basic than NH_3

Answer: D

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7. Which of the following acids forms three series of salts ?

A. H_3PO_2

B. H_3BO_3

C. H_3PO_4

D. H_3PO_3

Answer: C

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8. Strong reducing behaviour of H_3PO_2 is due to

A. Low oxidation state of phosphorus

B. Presence of two - OH groups and one P-H bond

C. Presence of one - OH group and two P-H bonds

D. High electron gain enthalpy of phosphorus

Answer: C

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9. On heating lead nitrate forms oxides of nitrogen and lead. The oxides formed are :

A. N_2O, PbO

B. NO_2, PbO

C. NO, PbO

D. NO, PbO_2

Answer: B

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10. Which of the following elements does not show allotropy ?

A. Nitrogen

B. Bismuth

C. Antimony

D. Arsenic

Answer: A

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11. Maximum covalency of nitrogen is ..... .

A. 3

B. 5

C. 4

D. 6

Answer: C

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12. Which of the following statement is wrong ?

A. Single N-N bond is stronger than the single P-P bond

B. PH_3 can act as a ligand in the formation of coordination compound with transition elements

C. NO_2 is paramagnetic in nature

D. Covalency of nitrogen in N_2O_5 is four

Answer: A

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13. A brown ring is formed in the ring test for NO_3^- ion. It is due to the formation of

A. $\left[Fe(H_2O)_5(NO)\right]^{2+}$

B. $FeSO_4.\ NO_2$

C. $\left[Fe(H_2O)_4(NO)_2\right]^{2+}$

D. $FeSO_4,\ HNIO_3$

Answer: A

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14. Elements of group 15 form compounds in $+5$ oxidatin state. However, bismuth forms only one well characterised compound in $+5$ oxidation state. The compound is

A. Bi_2O_5

B. BiF_5

C. $BiCl_5$

D. Bi_2S_5

Answer: B

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15. On heating ammonium dichromate and barium azide separately we get

A. N_2 in both cases

B. N_2 with ammonium dichromate and NO with barium azide

C. N_2O with ammonium dichromate and N_2 with barium azide

D. N_2O with ammonium dichromate and $N_2O)$ with barium azide

Answer: A

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16. In the preparation of HNO_3, we get NO gas by catalytic oxidation of ammonia. The moles of NO produced by the oxidation of two moles of

NH_3 will be.

A. 2

B. 3

C. 4

D. 6

Answer: A

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17. The oxidation state of central atom in the aniom of compound NaH_2PO_2 will be.

A. $+3$

B. $+5$

C. $+1$

D. -3

Answer: C

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18. Write a balanced chemical equation for the reaction showing catalytic oxidation of NH_3 by atmosoheric oxygen.

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19. Write the structure of pyrophosphoric acid.

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20. PH_3 forms bubbles when passed slowly in water but NH_3 dissolves. Explain why ?

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21. In PCl_5 phosphorus is in sp^3 d hybridised state but all its five bonds are not equivalent. Justify your answer with reason.

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22. Why is nitric oxide paramagnetic in gaseous state but the solid obtained on cooling it is diamagnetic ?

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23. On reaction with Cl_2 phosphorus forms two types of halides 'A' and 'B'.

Halide 'A' is yellowish- white powder but halide 'B' is colourless oily liquid.

Identify A and B and write the formulae of their hydrolysis products.

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24. In the ring test of NO_3^- ion, Fe^{2+} ion reduces nitrate ion to nitric oxide, which combines with Fe^{2+} (aq) ion to form brown complex . Write the reactions involved in the formation of brown ring.

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25. P_4O_6 reacts with water according to equation $P_4O_6 \rightarrow 4H_3PO_3$. Calculate the volume of $0.1MNaOH$ solution required to neutralise the acid formed by dissolving 1.1g of P_4O_6 in H_2O.

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26. White phosphorus reacts with chlorine and the product hydrolyses in the presence of water. Calcualte the mass of HCl obtained by the hydrolysis of the product formed by the reaction of 62 g of white phosphorus with chlorine in the presence of water.

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27. Name three oxoacids of nitrogen . Write the disproportionation reaction of that oxoacid of nitrogen is in +3 oxidation state.

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28. Nitric acid forms an oxide of nitrogen on reaction with P_4O_{10}. Write the reaction involved . Also write the resonating structures of the oxide of nitrogen formed.

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29. (i) white phosphorus (ii) red phosporus and (iii) balck phosphorus. Write the difference between white red and black phosphorus on the basis of their structure and reactivity.

Phosphorus has three allotropic forms __

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30. Given an example to show the effect of concentration of nitric acid on the formation of oxidation product.

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31. PCl_5 reacts with finely divided silver on heating and a white silver salt is obtained , which dissolves on adding excess aqueous NH_3 solution. Write the reactions involved to explain what happens.

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32. Phosphorus forms a number of oxoacids. Out of these oxoacids, phosphinic acid has strong reducing property. Write its structure and also write a reaction its reducing behaviour.

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Ncert Exemplar Problems With Answers Hints And Solutions Multiple Choice Questions Ii

1. Which of the following is correct for P_4 molecule of white phosphorus ?

A. It has 6 lone pairs of electrons

B. It has six P-P single bonds

C. It has three P-P single bonds

D. It has four lone pairs of electrons

Answer: B::D

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Ncert Exemplar Problems With Answers Hints And Solutions Assertion And Reason Type Questions

1. Assertion : N_2 is less reactive than P_4.

Reason : Nitrogen has more electron gain enthalpy than phosphorus.

A. Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.

B. Both assertion is and reason are correct statements, but reason is not the correct explanation of the assertion.

C. Assertion is correct, but reason is wrong statement.

D. Assertion is wrong but reason is correct statement.

Answer:

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2. Assertion : HNO_3 makes iron passive.

Reason : HNO_3 forms a protective layer of ferric nitrate on the surfae of iron.

A. Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.

B. Both assertion is and reason are correct statements, but reason is not the correct explanation of the assertion.

C. Assertion is correct, but reason is wrong statement.

D. Assertion is wrong but reason is correct statement.

Answer:

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Ncert Exemplar Problems With Answers Hints And Solutions Long Answers Questions

1. An amorphous soild A burns in air to form a gas B which turns lime water milky. The gas is also produced as a by - product during roasting of sulohide ore. This gas decolourises acidified aqueous $KMnO_4$ solution and reduces Fe^{3+} to Fe^{2+} . Identify the solid A and the gas B and write the reactions involved.

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2. On heating lead (II) nitrate gives a brown gas " A". The gas " A" on cooling changes to colourless solid "B" . Solid B on heating with NO changes to a blue solid 'C . Identify ' A', 'B' and' C and also write reactions involved and draw the structures of 'B' and 'C' .

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3. On heating compound (A) gives a gas (B) which is a constituent of air. This gas when treted with 3 moles of hydrogen (H_2) in the presence of a catalyat gives another gas (C) which is basic in nature. Gas C on further oxidation in moist condition gives a compound (D) which is a part of acid rain. Identify compounds (A) to (D) and also give necessary equations of all the steps involved .

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Additional Questions Very Short Answer Questions

1. Why the element of second period shows a number of difference in properties from other members of their respective families?

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2. INERT PAIR EFFECT

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3. $Bi(V)$ and $Sb(V)$ which may be a stronger oxidizing agent and why ?

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4. Give reasons for the least reactivity of nitrogen molecule.

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5. Nitrogen is much less reactive than phosphorus. Explain.

Or Phosphorus is much more reactive than nitrogen. Explain.

Or Nitrogen is relatively inert as compared to phosphorus. Why?

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6. Arrange the following in decreasing order of basic strength of 15 group hydrides

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7. Which is least acidic ? SbH_3, PH_3, NH_3, AsH_3

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8. Which is least basic ? SbH_3, PH_3, NH_3, AsH_3 ?

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9. Which is a stronger reducing agent , SbH_3 of BiH_3 , and why ?

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10. Why BiH_3 is strongest reducing agent amongst group 15 hydrides ?

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11. Which of the following is/are not known ?

PCl_3, $AsCl_3$, $SbCl_3$, NCl_5, $BiCl_5$.

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12. Which of the following is more covalent : $SbCl_5$ or $SbCl_3$?

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13. Write balanced equation when NH_3 is dissolved in water.

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14. ON adding NaOH to ammonium sulphate, a colourless gas with pungent odour is evolved which forms a blue coloured complex with Cu^{2+} ions. Identify the gas.

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15. Write chemical equation for thermal decomposition of ammonium dichromate.

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16. How is nitrogen prepared from ammonia ?

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17. What is laughing gas ? How is it prepared ?

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18. What happens when a mixture of ammonium sulphate and sodium nitrate is heated. Write the equation.

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19. $Pb(NO_3)_2$ on heating gives a brown gas which undergoes dimerization on cooling? Identify the gas.

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20. What is fuming nitric acid ? What colour is it ?

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21. Write one reducing property of nitrous acid. Also give equation.

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22. Concentrated nitric acid renders aluminium passive. Give reasons.

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23. The N-O bond in NO_2^- is shorter than N-O bond in NO_3^-. Account for this observation.

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24. Complete the following reaction ?

$HNO_3 \xrightarrow{P_4O_{10},\ \Delta}$?

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25. Write balanced equation when powdered aluminium is boiled with caustic soda solution in presence of sodium nitrite.

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26. Write the formula of the compound of iodine which is obtained when conc. HNO_3 oxidises I_2.

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27. Write the formula of the compound of phosphorus which is obtained when conc. HNO_3 oxidises P_4.

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28. Complete the equation :

$\left[Fe(H_2O)_6\right]^{2+} + NO \rightarrow$

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29. In the ring test for identification of nitrate ion, what is the formula of the compound responsible for the brown ring formed at the interface of the two liquids ?

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30. Important allotropic forms of phosphorus are white phosphorus, red phosphorus and black phosphorus. Among these which allotropic form is more reactive ? Why ?

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31. Write the chemical equation for the following :

$Ca_3(PO_4)_2 + SiO_2 + C \xrightarrow{\text{Heat}}$

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32. Why is white phosphorus kept under water ?

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33. How will you obtain phosphine from phosphorus ?

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34. On being slowly passed through water, PH_3 forms bubbles but NH_3 dissolves. Why is it so ?

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35. Give the chemical equation for the reaction the occurs between iron and copper sulphate solution.

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36. Which is more stable PCl_5 or PCl_3 ?

Or What happens when PCl_5 is heated ?

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37. Why is PCl_5 more covalent than PCl_3 ?

Watch Video Solution

38. Why does PCl_5 fume in moisture ?

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39. Complete the following reactions :

(i) $P_4 + SOCl_2 \rightarrow$

(ii) $CH_3COOH + PCl_5 \rightarrow$

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40. Suggest a method for the laboratory preparation of DCl.

Write a balanced equation for the reaction.

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41. What is the oxidation number of phosphorus in H_3PO_2 molecule ?

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42. H_3PO_2 and H_3PO_3 act as good reducing agents but H_3PO_4 does not. Explain.

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43. Why does H_3PO_3 act as a reducing agent but H_3PO_4 does not ?

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44. Why does orthophosphoric acid exist as a syrupy liquid ?

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45. How is pyrophosphoric acid related to orthophosphoric acid ?

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46. What kind of molecules show disproportionation reactions ?

Give one example of a compound each of nitrogen and phosphorus

which show disproportionation reactions.

Write chemical equation in each case.

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47. CN^- ion is known but CP^- ion is not known.

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Additional Questions Short Answer Questions

1. Name the elements of group 15. What is their valence shell elecrtonic configuration ?

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2. List the various oxidation states of nitrogen and give an example of a compound or ion for each case.

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3. Write the shapes of the hydrides of group 15 elements. Arrange them in order of (i) decreasing basic strength (ii) increasing bond angle (iii) decreasing character.

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4. Discuss the anomalous behaviour of nitrogen ?

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5. Complete the following reactions :

(a) $(NH_4)_2Cr_2O_7 \xrightarrow{\text{heat}}$ $(b) NH_4Cl + NaNO_2 \xrightarrow{\text{heat}}$

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6. Explain Ostwald process for manufacture of nitric acid.

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7. (a) Draw the structure of nitric acid and write its uses.

(b) Draw the structure of NO_3^- ,

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8. What happens when (i) zinc and (ii) copper react with (a) conc. HNO_3 and (b) dil. HNO_3.

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9. Complete the following reactions :

(i) $Cu + HNO_3$ (dilute) $\rightarrow$

(ii) $I_2 +$ conc. $HNO_3 \rightarrow$

(iii) C+conc. $HNO_3 \rightarrow$

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10. Write three differences between the properties of red and white phosphours.

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11. How is phosphine prepared in the laboratory ? Write its balanced equation. How does it react with

(i) Cl_2 (ii) acidified $CuSO_4$ solution (iii) O_2 (iv) $AgNO_3$ solution (v) HI ?

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12. Complete the following chemical equations :

(a) $Ca_3P_2(s) + H_2O(l) \rightarrow$

(b) $P_4 + NaOH + H_2O \rightarrow$

(c) $HgCl_2 + PH_3 \rightarrow$

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13. How is PCl_3 prepared from white phosphorus ? How does it react with (i) SO_3 (ii) S_2Cl_2 ?

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14. Write balanced equation for the formation of NCl_3 and PCl_3. Give equtions for hydrolysis reactions of NCl_3 and PCl_3.

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15. Give two methods of preparation of PCl_5 and discuss its structure.

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16. Complete the following chemical equations :

(a) $P_4 + 8SOCl_2 \rightarrow$

(b) $P_4 + SO_2Cl_2 \rightarrow$

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17. Give structures of P_4O_6 and P_4O_{10}.

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18. Draw the structures of the following :

(a) H_3PO_2

(b) H_3PO_3

(c) H_3PO_4

(d) $H_4P_2O_5$

(e) $H_4P_2O_7$

(f) $(HPO_3)_3$

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19. (a) Write chemical equation involved in the preparation of H_3PO_3.

(b) What is basicity of H_3PO_2 ?

(c) What happens when orthophosphorus acid (H_3PO_3) is heated ?

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20. Arrange the following in the increasing order of property mentioned :

(i) H_3PO_3, $(H_3PO_4$, H_3PO_2 (Reducing character)

(ii) $NH_3, PH_3, AsH_3, SbH_3, BiH_3$ (Base strenght)

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Additional Questions Long Answer Questions

1. Write the names and formulae of any five oxides of nitrogen.

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2. (a) Describe the favourable conditions for the manufacture of ammonia by Haber's process

(b) Arrange the following in order of increasing basic strength : $BiH_3, SbH_3, PH_3, NH_3, AsH_3$.

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Analytical Questions And Problems With Answers Solutions Questions

1. A certain element is a metalloid that forms an acidic oxide with the formula R_2O_5. Identify the elements

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2. Considering the fact that N_2 makes up about 79% of the atmosphere, why don't animals use the more abundant N_2 instead of O_2 for biological reactions.

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3. NCl_3 gets readily hydrolysed while NF_3 does not. Why ?

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4. NCl_3 gets hydrolysed to from NH_3 and $HOCl$ while PCl_3 on hydrolysis gives H_3PO_3 and HCl. Explair why ?

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5. NCl_3 is an endothermic compound while NF_3 is an exothermic compound.

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6. Amoung the hydrides of Group - 15 elements , which have the :

(a) lowest boiling point ? (ii) maximum basic character ?

(iii) highest bond angle ? (d) maximum reducing character ?

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Analytical Questions And Problems With Answers Solutions Problems

1. When a mixture of ammonium chloride and potassium dichromate was heated, a stable colourless gass (A) was evolved which did not support combustion, but magnesium continued to burn in it. The gas (A) reacted

with calcium carbide in an electric furnace a solid (B) which was slowly hydrolysed by water forming an insoluble substance (C) and the solution of a substance (D) which turned Nessler's reagent brown. Identify substances (A) to (E) and explain all the reactions involved.

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2. A colourless inorganic salt (A) decomposes completely at about $25^{\circ}C$ to give only two products, (B) and (C), leaving no residue. The product (C) is a liquid at room temperature and neutral to moist litmus paper while the gas (B) is a neutral oxide. White phosphorus burns in excess of (B) to produce a strong white dehydrating agent. Write balanced equations for the reactions involved in the above process.

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3. When conc. H_2SO_4 was added to an unknown salt present in a test which was heated, a brown gas (A) was evolved. The gas intenstified when copper turning were also added into the test tube. On cooling, the gas

(A) changed into a colourless liquid (B).

(a) Identify the gases A and B

(b) Write equations for the reactions involved.

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4. A translucent white waxy solid (A) on heating in an inert atomosphere is converted to its allotropic form (B). The solid (A) on reaction with very dilute aqueous KOH liberates a highly poisonous gas (C) having rotten fish smell. With excess of chlorine, (A) forms (D) which hydrolyses to compound (E). Identify compounds (A) to (E).

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Competition Focus Jee Main And Advanced Medical Entrance Special I Multiple Choice Questions With One Correct Answer

1. Which is true regarding nitrogen ?

A. Less electronegativity

B. Has low ionisation enthalpy

C. d-orbitals are available

D. Ability to forom $p\pi - p\pi$ bonds with iteslf

Answer: D

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2. Which ordering of compounds is according to the 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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3. In which of the following compounds nitrogen exhibits highest oxidation state

A. N_2H_4

B. NH_3

C. N_3H

D. NH_2OH

Answer: C

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4. The order of the oxidation state of the phosphours atom in H_3PO_2, H_3PO_4, H_3PO_3 and $H_4P_2O_6$ is

A. $H_3PO_4 > H_3PO_2 > H_3PO_3 > H_4O_2O_6$

B. $H_3PO_2 > H_3PO_3 > H_4P_2O_6 > H_3PO_4$

C. $H_3PO_3 > H_3PO_2 > H_3PO_4 > H_4P_2O_6$

D. $H_3PO_4 > H_4P_2O_6 > H\_(3)PO_3 > H_3PO_2$

Answer: D

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5. The following are some statements related to VA group 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.

The correct statements are

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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6. The molecule having smallest bond angle is

A. $AsCI_3$

B. $SbCl_3$

C. PCl_3

D. NCl_3

Answer: B

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7. Among the trihalides of nitrogen, which one is the least basic ?

A. NF_3

B. NCl_3

C. NBr_3

D. NI_3

Answer: A

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8. Which of the of the following fluoro -compouds is most likely to beahve as a Lewis base?

A. BF_3

B. PF_3

C. CF_4

D. SiF_4

Answer: B

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9. Which of the following is not hydrolysed

A. $AsCl_3$

B. PF_3

C. $SbCl_3$

D. NF_3

Answer: D

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10. 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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11. Extra pure N_2 can be obtained by heating

A. $Ba(N_3)_2$

B. $(NH_4)_2Cr_2O_7$

C. NH_4NO_2

D. $(NH_4)_2SO_4$

Answer: D

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12. The compound that does not produce nitrogen gas by the thermal decomposition is

A. $Ba(N_3)_2$

B. $(NH_4)_2Cr_2O_7$

C. NH_4NO_2

D. $(NH_4)_2SO_4$

Answer: D

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13. Very pure nitrogen can be obtained by :

A. thermal decomposition of ammonium dichromate

B. treating aqueous solution of NH_4Cl and $NaNO_2$

C. liquefaction and fractional distillation of liquid air

D. thermal decomposition of sodium azide

Answer: D

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14. 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 CrO

Answer: A

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15. The orange solid on heating gives a colourless gas and a greensolid which can be reduced to metal by aluminium powder. The orange and the green solids are respectively

A. $(NH_4)_2Cr_2O_7$ and Cr_2O_3

B. $Na_2Cr_2O_7$ and CrO_3

C. $K_4Cr_2O_7$ and CrO_3

D. $(NH_4)_2CrO_4$ and CrO_3

Answer: A

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16. An inorganic salt (A) is decomposed on heating to give two products (B) and (C). Compound (C) is a liquid at room temperature and is neutral to litmus while compound (B) is a colourless neutral gas. Compounds (A), (B) and (C) are

A. NH_4NO_3, N_2O, H_2O

B. NH_4NO_2, NO, H_2O

C. CaO, H_2O, $CaCl_2$

D. $Ba(NO_3)_2$, H_2O, NO_2

Answer: A

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17. When a brown compound of Mn (A) is teated with HCl, it gives a gas (B). The gas (B) taken in excess reacts with NH_3 to give an explosive compound (C). The compounds A, B and C are

A. $A = MnO_2, B = Cl_2, C = NCl_3$

B. $A = MnO, B = Cl_2, C = NH_4Cl$

C. $A = Mn_3O_4, B = Cl_2, C = NCl_3$

D. $A = MnO_3, B = Cl_2, C = NCl_2$

Answer: A

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18. The gases produced in the reaction, $Pb(NO_3)_2 \xrightarrow{\Delta}$ and $NH_4NO_3 \xrightarrow{\Delta}$ 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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19. The reaction between NH_2^- and N_2O gives

A. NO

B. N_3^-

C. N_2O_5

D. NH_2NH_2

Answer: B

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20. 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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21. A colourless gas X forms a brown coloured gas when mixed with air. The gas X is

A. N_2O_5

B. N_2O_4

C. NO_2

D. N_2O_3

Answer: C

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22. Which statement is wrong for NO ?

A. It is anhydride of nitrous acid

B. Its dipole moment is 0.22 D

C. It forms dimer

D. It is paramagnetic

Answer: A

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23. 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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24. A gaseous substance dissolve in water giving a pale blue solution which decolouises $KMnO_4$ and oxidises Kl to l_2 in acidic medium :

A. N_2O_5

B. NH_3

C. N_2O_3

D. HNO_3

Answer: C

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25. The correct order of the acidic nature of oxides is in the order

A. $NO < N_2O < N_2O_3 < NO_2 < N_2O_5$

B. $N_2O < NO < N_2O_3 < NO_2 < N_2O_5$

C. $N_2O_5 < NO_2 < N_2O_3 < NO < N_2O$

D. $N_2O_5 < N_2O_3 < NO < N_2O$

Answer: B

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26. Which oxide of nitrogen is not a common pollutant introduced into the atmosphere both due to natural and human activity?

A. N_2O_5

B. NO_2

C. N_2O

D. NO

Answer: A

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27. Nitric acid can be obtained from ammonia via the formation of 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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28. Concentrated nitric acid upon long standing turns yellowish-brown due to the formation of :

A. NO

B. NO_2

C. N_2O

D. N_2O_4

Answer: B

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29. The reaction of zinc with dilute and concentrated nitric acid, respectively, produce

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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30. 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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31. Which of the following metal Fe, Zn, Pb, Ag and Pt do not give a metal nitrate on treatment with concentrated HNO_3?

A. Fe and Zn

B. Fe and Pt

C. Pb, Ag and Pt

D. Fe, Ag and Pt

Answer: B

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32. The brown ring test for nitrates depends on

A. the reduction of nitrate to nitric oxide

B. oxidation of nitric to nitrogen dioxide

C. reduction of ferrous sulphate ot iron

D. oxidising action of sulphuric acid

Answer: A

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33. The oxidation number of Fe in brown ring $\left[Fe(H_2O_3)_5NO\right]^{2+}$ is

A. 0

B. $+1$

C. $+2$

D. $+3$

Answer: B

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34. $\left[Fe(H_2O)_5NO\right]^{2+}$ is a complex formed during the brown ring test for NO_3^- ion. In this complex.

A. there are there unpaired electrons so that its magnetic moment is 3.87 B.M.

B. NO transfers its electron to Fe^{2+} so that iron exists as Fe (I) and NO as NO^+

C. the colour is because of charge transfer

D. all of the above statements are correct

Answer: D

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35. Out 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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36. Maximum number of covalent bonds formed by N and P are

A. 3,5

B. 3,6

C. 3,4,5

D. 3, 4, 6

Answer: A

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37. The percentage of p-character in the orbitals forming $p-p$ bonds in P_4 is

A. 25

B. 33

C. 50

D. 75

Answer: D

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38. Which one of the following forms vortex ring

A. P_2O_5

B. PH_3

C. NH_3

D. P_4O_{10}

Answer: B

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39. The reaction of white phosphorus with aqueous $NaOH$ gives phosphine along with another phosphorus containing compound. The reacation type, the oxidation states of phosphorus in phosphine and the other product are respectvely:

A. redox reaction , -3 and -5

B. redox reaction , +3 and +5

C. disproportionation reaction , -3 and -5

D. disproportionation reaction , -3 and +1

Answer: D

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40. The reaction of P_4 with X leads selectively to P_4O_6 The X is :

A. Dry O_2

B. A mixture of O_2 and N_2

C. Moist O_2

D. O_2 in the presence of aqueous NaOH

Answer: B

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41. P_4O_{10} is the anhydride of

A. H_3PO_2

B. H_3PO_3

C. H_3PO_4

D. $H_4P_2O_7$

Answer: C

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42. How many bridging atoms are present in P_4O_{10} ?

A. 6

B. 4

C. 2

D. 5

Answer: A

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43. Of the following compounds, the most acidic is

A. As_2O_3

B. P_2O_3

C. Sb_2O_3

D. Bi_2O_3

Answer: B

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44. Oxidation state of phosphorus in cyclotrimetaphosphoric acid is

A. $+3$

B. $+5$

C. -3

D. $+2$

Answer: B

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45. The correct formula of salt formed by the neutraliation of hypophosphorous 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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46. The oxoacid of phosphorus that reduces silver nitrate into metallic silver is

A. H_3PO_2

B. $H_4P_2O_6$

C. H_3PO_4

D. $H_4P_2O_7$

Answer: A

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47. The pair in which phosphours atoms have a formed oxidation state of $+3$ is

A. orthophosphorous acid and pyrophosphorous acids

B. pyrophosphorous acid and hypophosphoric acids

C. orthophosphorous and hyphophosphoric acids

D. pyrophosphorus and pyrophosphoric acids

Answer: A

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48. Which is the correct statement for the given acids ?

A. Phosphinic acid is a monoprotic acid while phosphonic acid is a diprotic acid

B. Phosphinic acid is a diprotic acid while phosphonic acid is a monoprotic acid

C. Both are diprotic acids

D. Both are triprotic acids

Answer: A

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49. Which of the following is a cyclic oxo acid ?

A. $H_4P_2O_7$

B. $H_4P_2O_6$

C. $H_3P_3O_9$

D. $H_5O_5O_{15}$

Answer: C

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50. Sulphuryl chloride (SO_2Cl_2) reacts with white phosphorus (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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51. $Cl - P - Cl$ bond angles in PCl_5 molecule are

A. 120° and 90°

B. 60° and 90°

C. 60° and 120°

D. 120° and 30°

Answer: A

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52. The compound which has molecular nature in gas phase but ionic in solid state is

A. PCl_5

B. CCl_4

C. PCl_3

D. $POCl_3$

Answer: A

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53. What will be the resultant products formed when the phosphorus hailde PBr_5 splits up ?

A. $[PBr_4]^+$ and Br^-

B. $[PBr_6]^-$ and $[PBr_4]^+$

C. $[PBr_4]^+$

D. $[PBr_6]^-$

Answer: A

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54. Excess of PCl_5 reacts with concentrated H_2SO_4 giving :

A. sulphuryl chloride

B. sulphurous acid

C. chlorosulphonic acid

D. thionyl chloride

Answer: A

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55. Reaction of PCl_3 and PhMgBr would give

A. bromobenzene

B. chlorobenzene

C. triphenylphosphine

D. dichlorobenzene

Answer: C

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Competition Focus Jee Main And Advanced Medical Entrance Special Ii Multiple Choice Questions With One Or More Than One Correct Answers

1. Which of the following pairs of ions are isoelectronic and also isostructural ?

A. CO_3^{2-} , NO_3^-

B. ClO_3^- , CO_3^{2-}

C. SO_3^{2-} , NO_3^-

D. ClO_3^- , SO_3^{2-}

Answer: A::D

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2. The compound (s) which generate (s) N_2 upon thermal decomposation is (are) :

A. NH_4NO_3

B. $(NH_4)_2Cr_2O_7$

C. $Ba(N_3)_2$

D. Mg_3N_2

Answer: B::C

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3. Based on the compounds of group 15 elements, the correct statement (s) is (are)

A. Bi_2O_5 is more basic than N_2O_5

B. NF_3 is more covalent than BiF_3

C. PH_3 boils at lower temperature then NH_3

D. the N-N single bond is stronger than the P-P single bond

Answer: A::B::C

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4. 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 diamaganetic

C. contains N-N bond

D. reacts with Na-metal producing brown gas

Answer: B::D

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5. The nirogen oxide (s) that contains $N - N$ bonds 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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6. A solution of colourless salt H on boiling with axcess $NaOH$ 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) H is (are)

A. NH_4NO_3

B. NH_4NO_2

C. NH_4Cl

D. $(NH_4)_2SO_4$

Answer: A::B

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7. White phosphorus P_4 has the following characteristics.

A. 6 P-P single bond

B. 4 P-P single bonds

C. 4 lone pair of electrons

D. P-P-P angle of 60°

Answer: A::C::D

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8. Which of the following are correct statements ?

A. Oxides of phosphorus, P_2O_3 and P_2O_5 exist as monomers

B. Solid PCI_5 exists as tetrahedral $[PCl_4]^+$ and octahedral $[PCl_6]^-$ ions

C. Solid PBr_5 exists as $[PBr_4]^+ Br^-$

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

Answer: B::C::D

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Competition Focus Jee Main And Advanced Medical Entrance Special Iii Multiple Choice Questions Based On The Given Passage Comprehension

1. Upon heating $KClO_3$ in presence of catalytic amount of MnO_2, a gas W is formed. Excess amount of W reacts with white phosphorus to given X. The reaction of X with pure HNO_3 gives Y and Z.

Y and Z are, respectively

A. N_2O_5 and HPO_3

B. N_2O_3 and H_3PO_4

C. N_2O_4 and H_3PO_3

D. N_2O_4 and HPO_3

Answer: A

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2. Upon heating $KCIO_3$ in presence of catalytic amount of MnO_2, a gas W is formed. Excess amount of W reacts with white phosphours to given X. The reaction of X with pure HNO_3 gives Y and Z.

W and X are, respectively

A. O_2 and P_4O_6

B. O_2 and P_4O_{10}

C. O_3 and P_4O_6

D. O_3 and P_4O_{10}

Answer: B

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1. Match the entries of column I with appropriate entries of coloumn II and choose the correct option out of the four options (a), (b), (c) and (d) given at the end of each question.

	Column I		Column II
(A)	PCl_5	(p)	Angular
(B)	IF_7	(q)	Pyramidal
(C)	H_3O^+	(r)	Trigonal bipyramidal
(D)	ClO_2	(s)	Pentagonal bipyramidal

A. $A-r, B-s, C-q, D-p$

B. $A-r, B-q, C-p, D-s$

C. $A-p, B-s, C-q, D-r$

D. $A-s, B-p, C-r, D-q$

Answer: A

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Competition Focus Jee Main And Advanced Medical Entrance Special V Matrix Match Type Questions

1. Match the entries of column I with appropriate entries of coloumn II. Each entry in column I may have one or more than one correct option from column II. If the correct matches are A-p, s , B-r, C-p, q , D-s, then the correctly bubbled 4 $\times$ 4 matrix should be as follows :

	Column I		Column II
(A)	$H_3PO_3 \xrightarrow{\Delta}$	(p)	One of the products acts as a reducing ag
(B)	$PCl_3 + H_2O \xrightarrow{\Delta}$	(q)	One of the products is a tribasic non-red
(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

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2. Match each of the reaction given in Column I with the corresponding product(s) given in Column II.

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

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Competition Focus Jee Main And Advanced Medical Entrance Special Vi Integer Type Questions

1. Maximum number of oxidation states which nitrogen can show in its compound is ....

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2. The total number of lone pair of electrons in N_2O_3 is

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3. Amongst the following the metals which become passive when dipped in conc. HNO_3 are Sn, Pb, Fe, Cr, Zn, Ni, Hg, Al, Cu.

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4. What is the basicity of hypohosphours acid ?

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5. X is a pale yellow solid. It hydrolyses to $POCl_3$ in moist air and finally gets converted into phosphoric acid. Z exists as an ionic solid. The total number of atoms present in its cation is.

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6. Among the following, the number of compounds that can react with PCl_5 to give $POCl_3$ is O_2,CO_2,SO_2,H_2O,H_2SO_4,P_4O_{10}.

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7. The total number of compounds having at least one bridging oxo group among the molecules given below is ____.

$N_2O_3, N_2O_5, P_4O_6, P_4O_7, H_4P_2O_5, H_5P_3O_{10}, H_2S_2O_3, H_2S_2O_5$

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Competition Focus Jee Main And Advanced Medical Entrance Special Vii Numerical Value Type Questions In Decimal Notation

1. In the following sequence of reactions, the amount of D (in g) formed from 72 g of Mg is..... (The yield (%) corresponding to the product in each step is given in the parenthesis)

$$\underset{72g}{Mg} \xrightarrow[\text{Strong heating}]{N_2,\text{excess}} \underset{100\,\%}{A} \xrightarrow{H_2O} \underset{(\,90\,\%\,)}{B} \xrightarrow{\text{conc.}HNO_3} \underset{(\,80\,\%\,)}{C} \xrightarrow{\text{Heat}} \underset{(\,90\,\%\,)}{D}$$

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Competition Focus Jee Main And Advanced Medical Entrance Special Viii Assertion Reason Type Questions

1. Statement -1 : Although NaH_2PO_2 contains two H-atoms, it is not an acid salt.

Satement -2 : It contains two ionisable hydrogens.

A. Statement-1 is True, Statement-2 is True , Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True , Statement-2 is not a correct explanation for Statement-1.

C. Statement-1. is True, Statement-2 is False.

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

Answer: C

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2. Assertion. Nitrogen and oxygen are the main components in the atmosphere but these do not react to form oxides of nitrogen.

Reason. The reaction between nitrogen and oxygen requires high temperature.

A. If both assertion and reason are true, and is the correct explanation of the assertion.

B. If both assertion and reason are true, but reason is not the correct explanation of the assertion.

C. If assertion is true, but reason is false.

D. If both assertion and reason are false

Answer: A

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3. Assertion. Nitrogen is less reactive than molecular oxygen.

Reason. The bond length of N_2 is shorter than that of oxygen.

A. If both assertion and reason are true, and is the correct explanation of the assertion.

B. If both assertion and reason are true, but reason is not the correct explanation of the assertion.

C. If assertion is true, but reason is false.

D. If both assertion and reason are false

Answer: B

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4. Assertion. HNO_3 renders iron passive.

Reason. Iron reacts with HNO_3 to form ferric nitrate.

A. If both assertion and reason are true, and is the correct explanation of the assertion.

B. If both assertion and reason are true, but reason is not the correct explanation of the assertion.

C. If assertion is true, but reason is false.

D. If both assertion and reason are false

Answer: C

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5. Assertion. When NO reacts with $FeSO_4$, a brown coloured complex is formed.

Reason. In the complex, the coordination number of Fe is + 6.

A. If both assertion and reason are true, and is the correct explanation of the assertion.

B. If both assertion and reason are true, but reason is not the correct explanation of the assertion.

C. If assertion is true, but reason is false.

D. If both assertion and reason are false

Answer: B

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6. Assertion NF_3 is weaker ligands than $N(CH_3)_3$

Reason NF_3 ionises to give F^{Θ} ions in aqueous solution .

A. If both assertion and reason are true, and is the correct explanation of the assertion.

B. If both assertion and reason are true, but reason is not the correct explanation of the assertion.

C. If assertion is true, but reason is false.

D. If both assertion and reason are false

Answer: C

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7. Assertion: On cooling, the brown colour of nitrogen dioxide disappears. Reason: On cooling, NO_2 undergoes dimerisation resulting in the pairing of the odd electron in NO_2.

A. If both assertion and reason are true, and is the correct explanation of the assertion.

B. If both assertion and reason are true, but reason is not the correct explanation of the assertion.

C. If assertion is true, but reason is false.

D. If both assertion and reason are false

Answer: A

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8. Assertion : P_4 is more reactive than N_2

Reason: P-P single bond in P_4 is much weaker than $N \equiv N$ triple bond in N_2

A. If both assertion and reason are true, and is the correct explanation of the assertion.

B. If both assertion and reason are true, but reason is not the correct explanation of the assertion.

C. If assertion is true, but reason is false.

D. If both assertion and reason are false

Answer: A

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9. Assertion (A) Elementary phosphorus exists in three principal allotropic forms , ie .white (or yellow),red (or violet) and black.

Reason (R) Of the three forms, white phosphorus is the most important and most reactive.

A. If both assertion and reason are true, and is the correct explanation of the assertion.

B. If both assertion and reason are true, but reason is not the correct explanation of the assertion.

C. If assertion is true, but reason is false.

D. If both assertion and reason are false

Answer: B

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10. Assertion : H_3PO_3 is a diabasic acid.

Reason: There are two H atoms directly attached to P.

A. If both assertion and reason are true, and is the correct explanation of the assertion.

B. If both assertion and reason are true, but reason is not the correct explanation of the assertion.

C. If assertion is true, but reason is false.

D. If both assertion and reason are false

Answer: C

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