



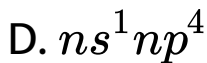
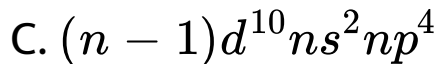
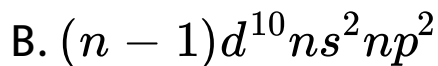
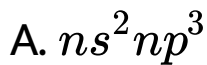
CHEMISTRY

BOOKS - S DINESH & CO CHEMISTRY (HINGLISH)

THE NITROGEN FAMILY

Multiple choice question

1. Which of the following configurations is characteristic of Group 15 elements?



Answer: B



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2. Which of the following statements are not correct about the hydrides of Group 15 elements ?

- A. The hydrides of the elements of group 15 are ionic and have planar triangular shape
- B. The thermal stability of the hydrides decreases down the group
- C. The basic character of the hydrides decreases down the group
- D. The reducing nature of the hydrides increases down the group

Answer: A



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3. The number of unpaired electrons in the ground state electronic configuration of Group 15 elements is

A. 2

B. 3

C. 4

D. 5

Answer: B



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4. The most non-metallic element in group 15 is ____.

A. Nitrogen

B. Bismuth

C. Phosphorus

D. Antimony

Answer: C



5. The element having a greater tendency to form multiple bond is

A. Nitrogen

B. Phosphorus

C. Bismuth

D. Antimony

Answer: A



6. The element of group having lowest ionisation energy is

A. Antmony

B. Bismuth

C. Nitrogen

D. Antimony

Answer: B



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7. Which of the following has lowest boiling point?

A. Nitrogen

B. Arsenic

C. Phosphorus

D. Antimony

Answer: C



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8. Amongst elements of Group 15 the property which increases down the group is

- A. Stability of - 3 oxidation state
- B. Reducing character of hydrides
- C. Electronegativity
- D. Acidic nature of oxides

Answer: B



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9. One of the following can form a chain of three atoms. It is

A. N

B. P

C. As

D. Sb

Answer: A



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10. Which one among the following is a metalloid?

A. Bi

B. Sb

C. N

D. P

Answer: A



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11. The oxidation state usually shown by nitrogen and phosphorus are

A. + 3 only

B. + 5 only

C. both +3 and +5

D. - 3

Answer: D



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12. The atomicity of nitrogen and phosphorus is respectively

A. 2 and 2

B. 2 and 3

C. 2 and 4

D. 2 and 5

Answer: C



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13. Which of the following members of nitrogen family does not show negative oxidation state?

A. P

B. As

C. Sb

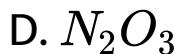
D. Bi

Answer: D



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14. The compound of nitrogen in which nitrogen shows -3 oxidation state is

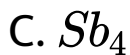
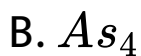


Answer: D



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15. Which of the following molecules show $p\pi - p\pi$ bonding?



Answer: B



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16. Nitrogen does not form complexes because

A. there are no vacant d - orbitals in the valence shell

B. the dissociation energy of nitrogen is very high

C. electronegativity of nitrogen is very high

D. it has stable electronic configuration

Answer: B



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17. The oxidation state of phosphorus vary from

A. -1 to $+3$

B. -3 to $+3$

C. -3 to $+5$

D. -5 to $+1$

Answer: C



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18. Which one of the following does not show allotropy?

A. Nitrogen

B. Phosphorus

C. Arsenic

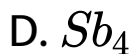
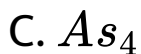
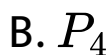
D. Antimony

Answer: A



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19. Which of the following molecules possesses one sigma bond and two π bonds?



Answer: A



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20. Which of the following is not the property of nitrogen?

A. Catenation

B. Nitrogen bonding

C. Low boiling point

D. Allotropy

Answer: D



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21. Nitrogen has no d-orbital in its valence shell and therefore it cannot

A. exhibit the oxidation state +5

B. have covalency greater than 3

C. exhibit hybridization

D. form oxides with oxidation state greater than +3

Answer: B



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22. Which of the following exist as diatomic molecules?

A. Nitrogen

B. Arsenic

C. Phosphorus

D. Antimony

Answer: A



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23. Which one of these is used by drivers for respiration?

A. $N_2 + O_2$ mixture

B. $Ar + O_2$ mixture

C. $He + O_2$ mixture

D. $Ne + O_2$ mixture

Answer: C



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24. The low reactivity of nitrogen is due to

A. small atomic radius

B. high electroquativity

C. stable configuration

D. high dissociation energy

Answer: D



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25. White Phosphorus may be removed from red Phosphorus by

- A. Sublimation
- B. Distillation
- C. Dissolving in CS_2
- D. Heating with an alkali

Answer: D



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26. Which of the following statements are not for phosphorus?

A. Phosphorus is a non - metal

B. It exists as a tetrahedral molecular solid

C. Phosphorus is less reactive than nitrogen

D. P - P bond is much weaker than N=N bond

Answer: C



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27. Which of the following properties of white phosphorus are shared by red phosphorus ?

A. It dissolves in CS_2

B. It burns when heated in air

C. It reacts with NaOH to give PH_3

D. It phosphorescences in air

Answer: B



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28. The $P - P - P$ bond angle in white phosphorous is _____ .

A. 120°

B. 90°

C. 60°

D. $109^\circ 28'$

Answer: C



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29. The semiconducting form of phosphorus is

A. White

B. Black

C. Red

D. None of these

Answer: B



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30. The disease Phossy Jaw is due to

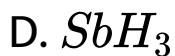
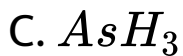
- A. White phosphorus
- B. Red phosphorus
- C. Scarlet Phosphorus
- D. Violet phosphorus

Answer: A



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31. Which has the lowest boiling point?

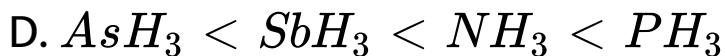
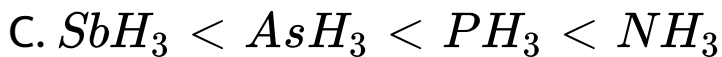
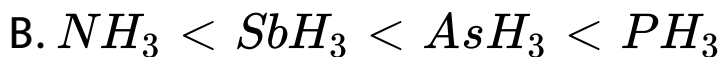
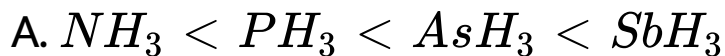


Answer: B



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32. The correct order of increasing stability is

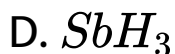


Answer: C



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33. Which of the following has largest bond angle?

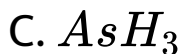


Answer: A



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34. Which of the following show association due to hydrogen bonding

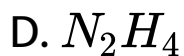
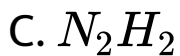


Answer: A



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35. Which is a Lewis base?

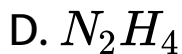
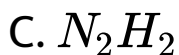


Answer: C



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36. Which of the following is the strongest reducing agent?

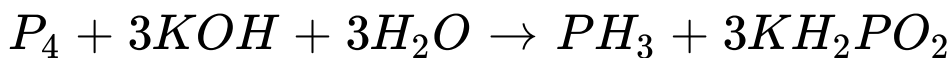


Answer: D



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37. In the reaction



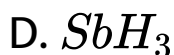
- A. P is reduced only
- B. P is oxidised only
- C. oxidation state of P is 1
- D. P is both oxidized and reduced

Answer: D



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38. Which of the following has maximum complex forming ability with a given metal ion?



Answer: A



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39. Which of the following is an electron deficient compound?



Answer: C



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40. High heat of vaporization of ammonia is due to its

- A. basic nature
- B. polar structure
- C. hydrogen bonding
- D. high solubility

Answer: C



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41. Liquid ammonia is used for refrigeration because

A. high dipole moment

B. heat of vaporisation

C. basicity

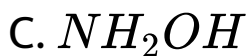
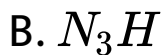
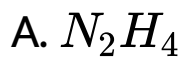
D. stability

Answer: B



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42. Acidic nitrogen hydride is



Answer: B



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43. It is recommended that ammonia bottles be opened after cooling in ice for sometime.

This is because

- A. it brings tears
- B. it has high vapour pressure
- C. it is explosive liquid
- D. None of these

Answer: B



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44. The wrong statement about ammonia is

A. NH_3 is oxidised with oxygen at $700^\circ C$

in the presence of platinum

B. NH_3 give black precipitate with calomel

C. NH_3 can be dried by P_2O_5 , H_2SO_4 and

$CaCl_2$

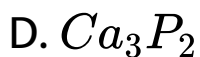
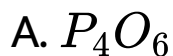
D. NH_3 gives white fumes with HCl

Answer: C



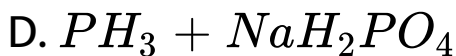
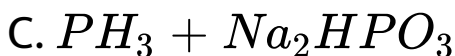
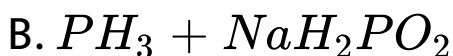
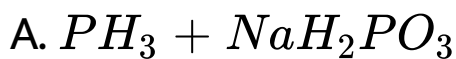
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45. Phosphorus is produced is by adding water to



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46. When white phosphorus is heated with caustic soda, the compounds formed are



Answer: B



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47. Phosphine produced smoky rings when it comes in contact with air because

- A. it reacts with water vapours
- B. it reacts with nitrogen
- C. it burns in air
- D. it contains impurities of P_2H_4

Answer: D



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48. Liquor ammonia is

A. ammonium hydroxide

B. liquefied ammonia gas

C. concentrated solution of NH_3 in water

D. a solution of NH_3 in alcohol

Answer: C



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49. Phosphine is not collected in air because

A. it is poisonous

B. It absorbs moisture

C. It catches fire spontaneously in air

D. It is combustible

Answer: C

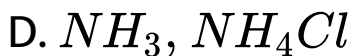
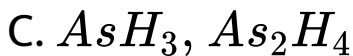
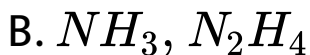
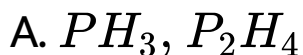


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50. A hydride (X) of Group 15 element is distinctly basic and has unexpectedly high boiling point. It reacts with $NaOCl$ to give

another hydride (Y), which is a strong reducing agent and is used in organic analysis.

X and Y are

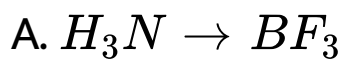


Answer: B



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51. A compound in which nitrogen has the covalency of four is



Answer: A



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52. Which of the following does not exist?

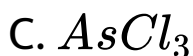
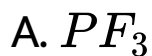


Answer: D



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53. Which of the following trihalides is not hydrolysed



Answer: A



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54. Bismuth does not form stable pentahalides because of

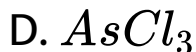
- A. its higher electronegativity
- B. its smaller size
- C. inert pair effect
- D. non availability of d - orbitals

Answer: C



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55. A white precipitate is obtained by the hydrolysis of

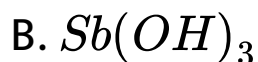


Answer: C



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56. $SbCl_3$ upon hydrolysis yields



D. None of these

Answer: C



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57. Which one of the following is an explosive?

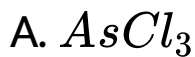


Answer: C



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58. Which one of the following does not undergo hydrolysis?



Answer: D



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59. Amongst the trihalides of nitrogen, which one has the highest dipole moment



Answer: B



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60. Which of the following is least basic?



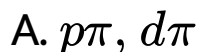


Answer: A



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61. In the compounds of the type POX_3 , P atoms show multiple bonding of the type



B. $d\pi, d\pi$

C. $p\pi - d\pi$

D. no multiple bond is present

Answer: C



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62. PCl_5 is kept in well stoppered bottles because

A. it is highly volatile

B. it reacts with oxygen

C. it reacts readily with moisture

D. it is explosive

Answer: C



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63. Which of the following statements about halides of group 15 elements is incorrect?

- A. phosphorus and the heavier elements As, Sb and Bi react directly with halogens
- B. Phosphorus can form all the pentahalides as well as all the trihalides
- C. As, Sb and Bi primarily give trihalides
- D. SbF_5 , $SbCl_5$ and AsF_5 can also be formed

Answer: B



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64. The solid PCl_5 exists as

A. PCl_5 molecules

B. P_2Cl_{10}

C. $[PCl_4] + [PCl_6]^-$

D. none

Answer: C



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65. A diatomic gas belonging to group 15 combines with a halogen to form a trihalides which is fairly stable and inert. The trihalide is

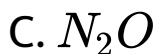


Answer: D



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66. Which of the following is used as anaesthetic?

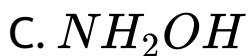
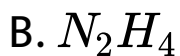
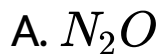


Answer: C



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67. The compound showing nitrogen in +1 oxidation state is



Answer: A



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68. Which of the following compounds is coloured?

A. NO

B. N_2O

C. NO_2

D. NH_3

Answer: C



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69. The acidic character of oxides of group 15,

N_2O_3 , P_2O_3 , As_2O_3 , Sb_2O_3 (in this order)

A. weakens in above order

B. increases

C. first increases then weakns in the above
order

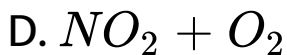
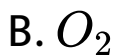
D. remains unchanged

Answer: A



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70. On strongly heating lead nitrate crystals, the gas which is evolved is

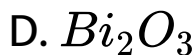
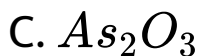
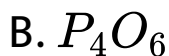
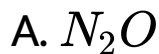


Answer: D



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71. Which of the following oxides is basic in nature?

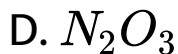
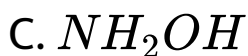
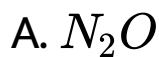


Answer: D



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72. A mixture of ammonia and air at about $800^{\circ}C$ in the presence of *Pt* gauze forms

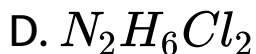
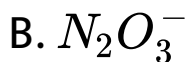


Answer: B



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73. Which of the following is paramagnetic?



Answer: C



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74. The dimerisation of NO_2 as the temperature is lowered and accompanied by

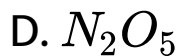
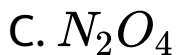
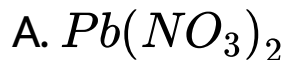
- A. an increase in pressure
- B. a darkening in pressure
- C. a decrease in Paramagnetism
- D. the formation of a colloid

Answer: C



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75. Nitrogen dioxide cannot be obtained by heating



Answer: B



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76. The bonds present in N_2O_5 are

A. only ionic

B. only covalent

C. covalent and coordinate

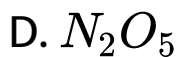
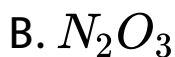
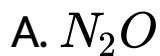
D. covalent and ionic

Answer: A



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77. Which of the following oxides form dimer?



Answer: C



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78. Which of the following reagents can separate nitric oxide from nitrous oxide?

A. Sodium nitroprusside solution

B. Ferrous sulphate solution

C. Nessler's reagent

D. Tollen's reagent

Answer: B



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79. Which one of the following oxides of nitrogen is called mixed anhydride ?

A. NO

B. NO_2

C. N_2O_4

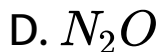
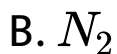
D. N_2O_5

Answer: B



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80. On heating a mixture of NH_4Cl and KNO_2 , we get

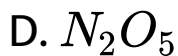
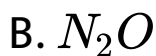
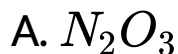


Answer: B



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81. Which one of the following contains three electron bond in its structure?



Answer: C



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82. Which one of the following oxides of nitrogen is a white solid?

A. NO

B. NO_2

C. N_2O_3

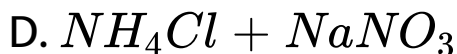
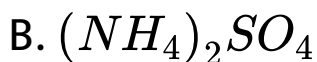
D. N_2O_5

Answer: D



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83. Laughing gas is prepared by heating



Answer: D



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84. Nitrous fumes are chemically

A. N_2O

B. NO_2

C. N_2O_3

D. NO

Answer: D



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85. The oxide of nitrogen that is neutral in character is

A. NO

B. NO_2

C. N_2O

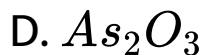
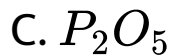
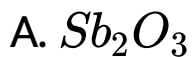
D. N_2O_3

Answer: C



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86. The oxide which on dissolving in water turns blue litmus acid?



Answer: C



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87. Which of the following oxides is an anhydride of nitrous acid?

A. NO

B. N_2O_3

C. N_2O_4

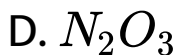
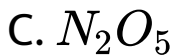
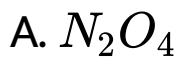
D. N_2O_5

Answer: B



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88. When nitric acid is heated with P_2O_5 , the oxide of nitrogen that is produced is

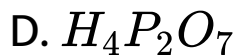
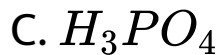
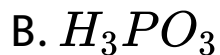
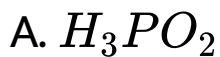


Answer: C



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89. The acid obtained by the action of cold water on P_4O_6 is

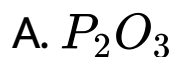


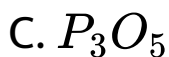
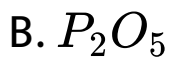
Answer: B



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90. The anhydride of orthophosphoric acid is



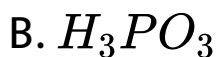
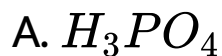


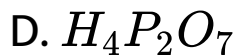
Answer: B



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91. P_4O_6 is chemically related to which acid?





Answer: B



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92. Lightening bolts in the atmosphere cause the formation of



C. NH_4OH

D. NH_2OH

Answer: B



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93. Man dies when nitrous oxide is inhaled in large quantities because

A. it is poisonous

B. it combines with haemoglobin

C. it causes laughing hysteria

D. None of these

Answer: C



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94. Flowers of phosphorus are

A. Arsenic

B. phosphorus

C. P_4O_6

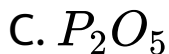
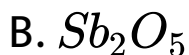
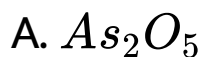


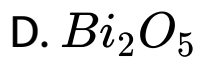
Answer: D



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95. Which of the following pentaoxides is most stable and donot show oxidising properties?





Answer: C



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96. Which of the following can give maximum number of oxides?

A. N

B. P

C. As

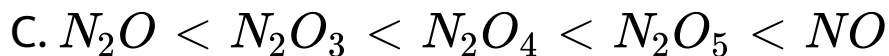
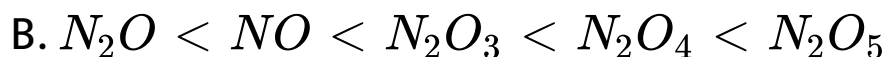
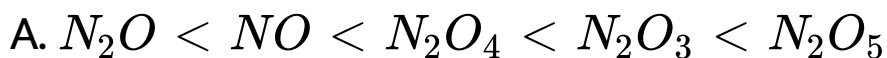
D. Bi

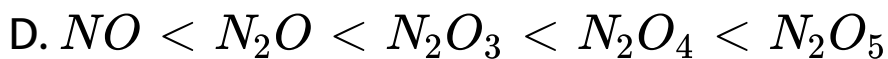
Answer: A



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97. The acidic strength of oxides of nitrogen follows the order:



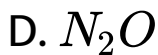
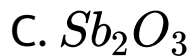
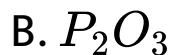
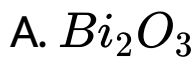


Answer: B



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98. A nitrate decomposes thermally to give an oxide of group 15 element. This oxide cannot be obtained by direct combination of the element and the oxygen. The trichloride of this group 15 element can hydrolyse only partially. The oxide is

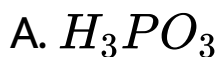


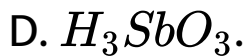
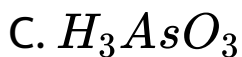
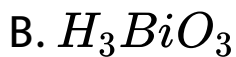
Answer: A



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99. Which of the following is basic in nature?





Answer: B



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100. On hydrolysis with water, the pentaoxides of group 15 elements give

A. Lower oxy (-ous) acid

B. Bases

C. Higher oxy (-ic) acid

D. None of these

Answer: C



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101. The correct order of decreasing acidic strength of oxyacids of group 15 elements is

A. HNO_3 , H_3PbSO_4 , H_3AsO_4 , H_3PO_4

B. H_3PO_4 , H_3AsO_4 , H_3SbO_4 , HNO_3

C. HNO_3 , H_3PO_4 , H_3AsO_4 , H_3SbO_4

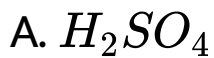
D. HNO_3 , H_3AsO_4 , H_3PO_4 , H_3SbO_4 .

Answer: C



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102. Which of the following acids possesses oxidising, reducing, and complex forming properties ?



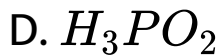
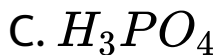
Answer: C



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103. Pernitric acid is chemically





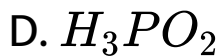
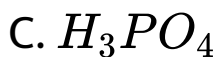
Answer: C



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104. Which of the following is most acidic in character?



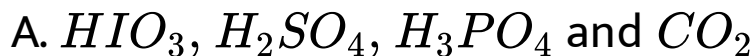


Answer: B



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105. Reaction of HNO_3 with I, S, P and c gives respectively



B. HIO_3 , H_2SO_4 , H_3PO_4 and CO_2

C. HIO_2 , H_2SO_4 , H_3PO_4 and CO

D. I_2O_5 , SO_2 , P_2O_5 and CO_2

Answer: A



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106. The salts of nitrous acid

A. act as reducing agent only

B. act as oxidising agent only

C. act as both reductants and oxidats

D. cannot exhibit redox properties

Answer: C



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107. Phosphorus has the oxidation state + 3 in

A. Phosphorus acid

B. Hypophosphors acid

C. Orthphoshoric acid

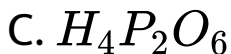
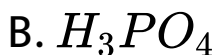
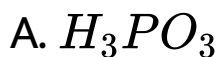
D. Pyroosphoric acid

Answer: A



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108. Which of the following form maximum $P - H$ bonds.



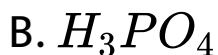
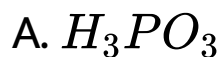


Answer: A



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109. Which one of the following is pyrophosphoric acid ?



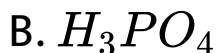
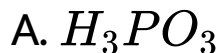


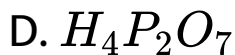
Answer: D



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110. Which of the following oxyacids of phosphorus is a reducing agent and monobasic?



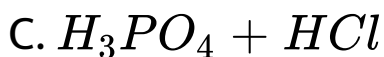
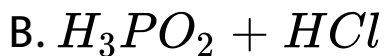
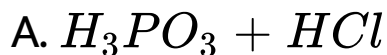


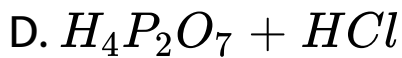
Answer: A



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111. With excess of water, PCl_5 gives





Answer: C



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112. In obtaining soft water, the salt of oxy acids of phosphorus used is

- A. Chlorapatite
- B. Microcosmic salt
- C. Calgon

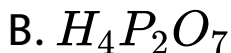
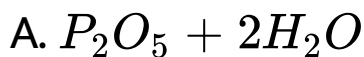
D. Rock phosphate.

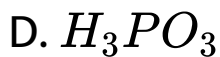
Answer: C



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113. The product formed when H_3PO_4 is heated to $600^\circ C$ is



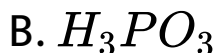
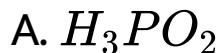


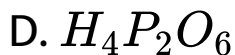
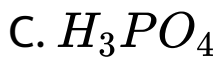
Answer: C



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114. Which of the following oxyacids of phosphorus is a reducing agent and monobasic?





Answer: B



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115. Phosphorus is manufactured by heating in a furnace

A. Bone ash , Sodium chloride and coke

B. Bone ash , silica and coke

C. Bone ash , silica and lime

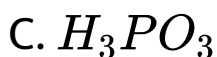
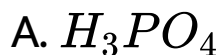
D. Bone ash , coke and lime stone

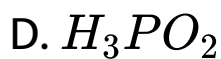
Answer: B



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116. Meta phosphoric acid has the formula





Answer: B



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117. Which of the following is tetrabasic?

A. Orthophosphorus acid

B. Orthophosphoric acid

C. Metaphosphoric acid

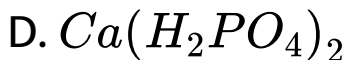
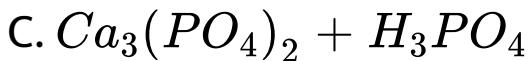
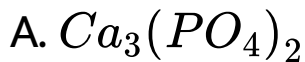
D. Pyrophosphoric acid

Answer: D



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118. Super phosphate of lime contains



Answer: D



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119. White phosphorus contains

A. P_2 molecules

B. P_6 molecules

C. P_4 molecules

D. P_5 molecules

Answer: C



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120. The basicity of H_3PO_4 is

A. 2

B. 3

C. 4

D. 5

Answer: B



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121. Phosphine is generally prepared in the laboratory

- A. By heating phosphorus in a current of hydrogen
- B. By decomposition of P_2H_4 at 110
- C. By heating red phosphorus with an aqueous solution of caustic soda
- D. By heating white phosphors with caustic potash

Answer: D



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122. In the manufacture of safety matches we use

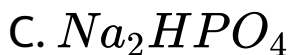
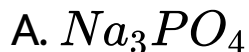
- A. White phosphorus
- B. Red phosphorus
- C. black phosphorus
- D. Selenium

Answer: B



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123. If phosphoric acid is allowed to react with sufficient quantity of $NaOH$, the product obtained is



Answer: A



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124. Red phosphorus is less reactive than yellow phosphorus because

- A. Its colour is red
- B. It is insoluble in CCl_4
- C. It is hard
- D. It is highly polymerised

Answer: D



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125. Sodium tripolyphosphate is used in

- A. Fertilizer
- B. Softening of water
- C. Fruit ripening
- D. None of these

Answer: B

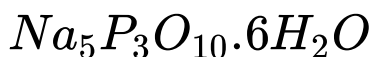


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126. Na_2O and P_4O_{10} on heating at $1000^\circ C$ yields

A. Sodium tripolyphosphate : $Na_5P_3O_{10}$

B. Sodium tripolyphosphate :



C. sodium dihydrogenphosphate :



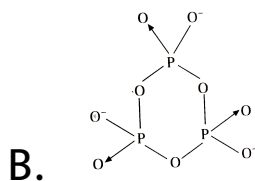
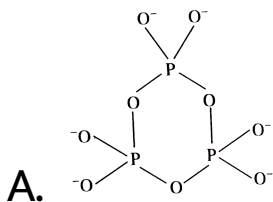
D. Sodium hydrogenphosphate: Na_2HPO_4

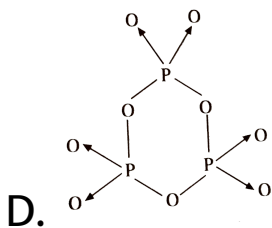
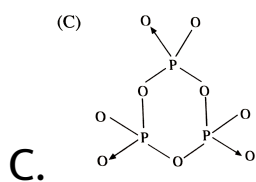
Answer: A



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127. Which of the following structures correctly represent trimetaphosphate?





Answer: B



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128. Which is wrongly matched?

A. Triethyl phosphate : insecticides

B. Tritolly phosphate : petrol additive

C. Triaryl phosphate : plasticzers

D. Tri - n - butyl

Answer: D



View Text Solution

129. Which is wrongly matched?

A. H_3PO_4 :Orthophosphoric acid

B. H_3PO_3 : Phosphorous acid

C. $H_5P_3O_{10}$: Pyrophosphoric acid

D. $H_6P_4O_{13}$: Tetrapolyphosphoric acid

Answer: C



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130. Phosphorus acid is syrupy because of

A. Strong covalent bond

B. van der Waal ' s forces

C. hydrogen bonding

D. None of these

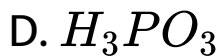
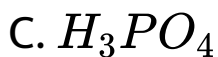
Answer: C



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131. One of the acid listed below is formed from P_2O_3 and the rest are formed from P_2O_5 . The acid formed from phosphorus (III) oxide is

A. HPO_3



Answer: D



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132. Phosphine is not obtained by the reaction

A. White P is heated with NaOH

B. Red P is heated with NaOH

C. Ca_3P_2 reacts with water

D. Phosphorus trioxide is boiled with water

Answer: B



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133. When a solution of white phosphorus in CS_2 is poured over saw dust, the latter catches fire spontaneously on blowing air upon it because

A. CS_2 is inflammable

B. CS_2 is volatile

C. Ignition temperature of white P is low

D. P is reactive

Answer: C



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134. Which form of phosphorus exist in highly polymeric layer type structure?

- A. Red phosphorus
- B. Black phosphorus
- C. White phosphorus
- D. Scarlet phosphorus

Answer: B



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135. White P is more reactive than N_2 because

- A. Electronegativity of P is low

B. Ionisation energy of P is low

C. P - P bond is weaker than N=N

D. All the above

Answer: C



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136. Phosphine gas is

A. Acidic

B. Basic

C. Neutral

D. An oxidising agent

Answer: B



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137. Smoke screen is produced by using

A. Calcium carbide

B. Calcium phosphide

C. Phosphorus trisulphide

D. Phosphorus trioxide

Answer: B



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138. Which of the following properties of white phosphorus are shared by red phosphorus ?

A. It phosphorescs in air

B. It reacts with hot aqueous NaOH to give phosphine

C. It dissolves in carbon disulphide

D. It burns when heated in air

Answer: D



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139. Phosphine produced smoky rings when it comes in contact with air because

A. PH_3 burns in air

B. PH_3 reacts with water vapours

C. It contains impurities of P_2H_4 which undergoes spontaneous combustion

D. PH_3 react with nitrogen N_2

Answer: C



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140. Red phosphorus is less reactive, less volatile and soluble in non-polar solvent than white/yellow phosphorus because

A. it has red molecular energy

B. it has high molecular energy

C. it possesses highly polymerised
structure

D. it forms condensation products

Answer: C



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141. Pyrophosphoric acid can form a series of salts with alkalis

A. Two

B. Four

C. Three

D. It cannot form any salt

Answer: A



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142. Phosphorus trioxide reacts with hot water to give

- A. Phosphorous acid
- B. Metaphosphoric acid
- C. Orthophosphoric acid
- D. Orthophosphoric acid and phosphine

Answer: D



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143. Which of the following reacts most rapidly with oxygen of air at ordinary temperature?

A. CO_2

B. red P

C. White P

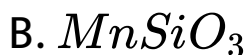
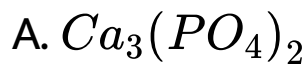
D. N_2

Answer: C



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144. Thomas slag is



Answer: A



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145. When orthophosphoric acid is heated to 873K, the product formed is

- A. Phosphine (PH_3)
- B. phosphorus Pentoxide P_2O_5
- C. phosphorus acid H_3PO_4
- D. metaphosphoric acid.

Answer: D



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146. Electron affinity of P is

A. more than N and As

B. less than N and less than As

C. more than N and less than As

D. equal to N and As

Answer: A



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147. Which of the following allotropes is good conductor of electricity?

A. Black phosphorus

B. White phosphorus

C. Red phosphorus

D. None

Answer: A



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148. Phosphide ion has the electronic structure similar to that of

A. Nitride ion

B. Fluoride ion

C. Sodium ion

D. Chloride ion

Answer: D



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149. White phosphorus is generally preserved
in

A. alcohol

B. water

C. Kerosene oil

D. ether

Answer: B



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150. Which one is not an ore of phosphorus?

A. Azurite

B. Chalorapatie

C. phosphorite

D. Fluorapatite

Answer: A



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151. P_2O_5 reacts with H_2SO_4 to give SO_3 and HPO_3 . Which property of P_2O_3 is depicted in this reaction?

- A. It acts as a strong dehydrating agent
- B. It is white powder
- C. It sublimes on heating
- D. It is acidic in nature

Answer: A



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152. Which out of the following gases is obtained when ammonium dichromate is heated?

A. Oxygen

B. Ammonia

C. Nitrogen

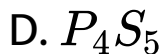
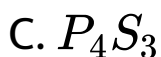
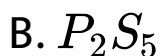
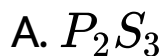
D. Nitrous oxide

Answer: C



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153. Which one of the following is used in the manufacture of 'strike anywhere' matches?



Answer: C



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154. The formula of microcosmic salt is



Answer: D



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155. Nitrogen content of urea is

A. 63

B. 70

C. 28

D. 47

Answer: D



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156. Yellow colour of HNO_3 is due to the presence of NO_2 is removed by

A. boiling the acid

B. passing ammonia through acid

C. bubbling air through the warm acid

D. adding a little Mg powder

Answer: C



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157. Tartaremetic contains

A. Arenic

B. Nitrogen

C. Bismuth

D. Antimony

Answer: D



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158. Royal water is

A. conc. HNO_3

B. aqua regia

C. conc. HNO_3 + conc. H_2SO_4

D. dilute HNO_3

Answer: B



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159. Graham's salt is

A. Na_3PO_4

B. $(NaPO_3)_n$

C. $Na_2SO_4 \cdot 10H_2O$

D. none

Answer: B



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160. Pearl white is

A. AsOCl

B. SbOCl

C. BiOCl

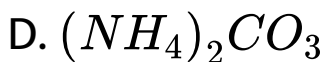
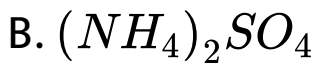
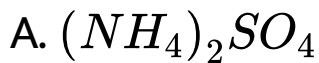
D. $(NH_4)_2CO_3$

Answer: C



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161. Smelling salt is

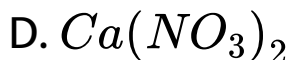
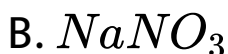
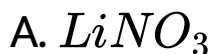


Answer: D



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162. Which of the following represents Norwegian salt petre?



Answer: D



163. CAN pellets are coated with calcium silicate because

- A. CAN is explosive
- B. To slow down the reaction
- C. CAN is hygroscopic
- D. CAN is water soluble

Answer: C



164. Which one is essential for nitrogen fixation ?

A. Zinc

B. Molybdeum

C. Copper

D. Boron

Answer: B



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165. The atomicity of yellow phosphorus is

A. 4

B. 3

C. 5

D. 8

Answer: A



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166. The number of vacant orbitals in the valence shell of phosphorous is ____.

A. 5

B. 3

C. 2

D. 0

Answer: A



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167. Which oxidation state is not shown by phosphorus?

A. -3

B. 3

C. 5

D. -2

Answer: D



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168. Which is not true of phosphorus?

A. Phosphorus exists in different allotropic forms

B. Black phosphorus has layer type structure

C. Yellow phosphorus is less reactive than red phosphorus

D. Yellow phosphorus exists as tetrahedral molecular solid

Answer: C



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169. Which of the following pairs contains elements belonging to group 15 but not exhibiting allotropy

A. N , P

B. N , Cl

C. N , Bi

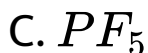
D. Bi , Po

Answer: C



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170. In which of the following halides the M-X bond lengths are not equal?

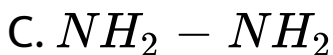
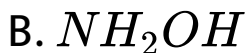


Answer: C



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171. When ammonia and sodium hypochloride are allowed to react, which nitrogen compound is formed?



Answer: C



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172. Which of the following species is strongest Lewis base?

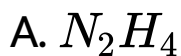


Answer: A



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173. Which among the following is strongest reducing agent?



Answer: A



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174. The high value of ΔH_{vap} of ammonia is attributed to its

- A. basic nature
- B. Association due to H - bonding
- C. Shape
- D. Covalent nature of N - H bonds

Answer: B



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175. In which pair of compounds, the oxidation state of nitrogen is -1?

A. Ammonia , hydroxylamine

B. Nitric oxide , nitric acid

C. Hydrazine , ammonia

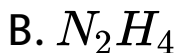
D. Hydrazine , hydroxylamine.

Answer: D



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176. Which hydrogen compound of nitrogen acts as acid?



D. None of these

Answer: C



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177. What is not true about $POCl_3$?

- A. The molecule does not contain $p\pi - p\pi$ bond
- B. The molecule contain three sigma bond
- C. The molecules contain $p\pi - p\pi$ bond
- D. The molecule contain $p\pi - d\pi$ bond

Answer: D



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178. Solid PCl_5 exists as

A. Dimer P_2Cl_{10}

B. $[PCl_4]^+ [PCl_6]^{2-}$

C. $[PCl_3][Cl_2]$

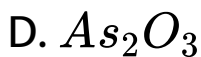
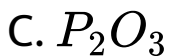
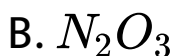
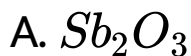
D. PCl_5 as mole

Answer: B



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179. Among the oxides given below which one is least acidic?



Answer: A



180. What is not applicable to N_2O_4 ?

A. It is diamagnetic at low temperature

B. It contains four nitrogen to oxygen bonds

C. It decolorises on heating to room temperature

D. It develops paramagnetism on heating to room temperature

Answer: C



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181. There is a little difference in acid strength in the series H_3PO_4 , H_3PO_3 and H_3PO_2 because

- A. Phosphorus in these acids exists in different oxidation states
- B. Number of unprotonated oxygen atoms responsible for increase of acidity due to

inductive effect remains the same

C. Phosphorus is not a highly electronegative element

D. Phosphorus oxides are less basic

Answer: B



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182. How many P-O bonds and how many lone pairs respectively are present in P_4O_6 molecule?

A. 12 , 4

B. 8 , 8

C. 12 , 16

D. 12 , 12

Answer: C



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183. Which element of group 15 forms highest number of oxoacids?

A. As

B. N

C. P

D. Sb

Answer: C



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184. Among the oxoacids given below the correct decreasing order of acid strength is (I)

H_3AsO_4 (II) H_3SbO_4 (III) HNO_3 (IV) H_3PO_4

A. IVgtIIIgtIIgtI

B. IIIgtIVgtIgtIV

C. IIIgtIIgtIVgtI

D. IIIgtIgtIIgtIV

Answer: B



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185. The number of P-O-P and P-O-H bonds present respectively, in pyrophosphoric acid molecule is

A. 1,2

B. 2, 2

C. 1, 4

D. 1, 8

Answer: C



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186. In trimetaphosphate ion, the number of O atom, P-O-P bonds and unit negative charges are respectively

A. 6 , 6 , 3

B. 3 , 6 , 3

C. 9 , 3 , 3

D. 9 , 6 , 3

Answer: C



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187. The number of P-O-H links in orthophosphoric acid molecule is

A. 2

B. 4

C. 3

D. 1

Answer: C



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188. The number of P-O-H and P-H bonds in orthophosphorus acid molecule are relatively

A. 2 , 1

B. 1 , 2

C. 2 , 2

D. 3 , 0

Answer: A



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Revision question

1. When conc. H_2SO_4 is added to dry KNO_3 brown fumes evolve. These fumes are of

A. SO_2

B. SO_3

C. NO_2

D. NO.

Answer: C



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2. Which of the following is a tetrabasic acid?

A. Orthophosphoric acid

B. Hypophosphorus acid

C. Metaphosphoric acid

D. Pyrocphoshoric acid

Answer: D



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3. Phosphine is prepared by the action of

A. P and H_2SO_4

B. P and NaOH

C. P and H_2S

D. P and HNO_3

Answer: B



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4. Which one of the following elements occur free in nature?

A. N

B. P

C. As

D. Sb

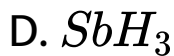
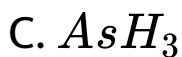
Answer: A



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5. The most stable hydride is

A. NH_3



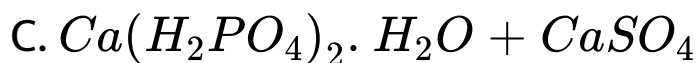
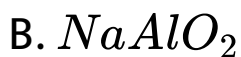
Answer: A



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6. Which of the following substances is used as fertilizer?





D. All the above

Answer: C



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7. Phosphide ion has the electronic structure similar to that of

A. Nitride ion

B. Fluoride ion

C. Sodium ion

D. Chloride ion

Answer: D



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8. BiCl_3 on hydrolysis forms a white precipitate of _____.

A. Bismuthic acid

B. Bismuth oxychloride

C. Bismuth pentachloride

D. Bismuth hydroxide

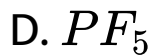
Answer: B



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9. Which one of the following compounds does not exist?

A. NCl_5

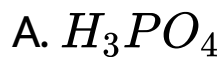


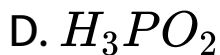
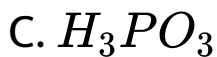
Answer: A



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10. Metaphosphoric acid has the formula





Answer: B



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

A. are both soluble in CS_2

B. can be oxidised by heating in air

C. consist of the same kind of atoms

D. can be converted into one another

Answer: A

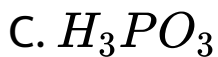


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12. When orthophosphoric acid is heated to $600^{\circ}C$ the product formed is

A. PH_3

B. P_2O_5



Answer: D



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13. Phosphine is not obtained by the reaction when

A. White P is heated with NaOH

B. Red P is heated with NaOH

C. Ca_2P_2 reacts with water

D. PH_4I is boiled with water.

Answer: B



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14. White P when boiled with strong solution of caustic soda produces

A. phosphine

B. Phosph acid

C. Phosphorus acid

D. None

Answer: A



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15. Red P can be obtained from white P by

A. Heating it with a catalyst in an inert atmosphere

B. Distilling it in an inert atmosphere

C. Dissolving it in CS_2 and crystallizing

D. Melting it and pouring the liquid into
water

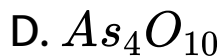
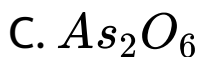
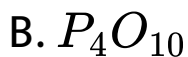
Answer: A



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16. Which of the following oxides will be the
least acidic?

A. P_4O_6



Answer: C



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17. In P_4O_6 , the number of oxygen atoms bonded to each phosphorus atom is

A. 1.5

B. 2

C. 3

D. 4

Answer: C



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18. With respect to protonic acids, which of the following statements is correct?

A. PH_3 is more basic than NH_3

B. PH_3 is less basic than NH_3

C. PH_3 is equally basic as NH_3

D. PH_3 is amphoteric while NH_3 is basic.

Answer: B



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19. When $AgNO_3$ is heated strongly the products formed are

A. NO and NO_2

B. NO_2 and O_2

C. NO_2 and N_2O

D. NO and O_2

Answer: B



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20. The $P - P - P$ bond angle in white phosphorous is _____ .

A. 120°

B. $109^{\circ} 28'$

C. 90°

D. 60°

Answer: D

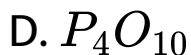


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21. Phosphine is produced by adding water to

A. CaC_2

B. HPO_3



Answer: C



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22. P_2O_5 is heated with water to give

A. Hyphosphorus acid

B. Phosphorus acid

C. Hyphosphoric acid

D. Orthophosphoric acid

Answer: D



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23. Basicity of orthophosphoric acid is

A. 2

B. 3

C. 4

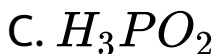
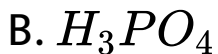
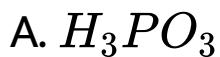
D. 5

Answer: B



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24. Oxidation state of +1 for phosphorus is found in

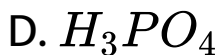


Answer: C



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25. PCl_3 reacts with water to form :



Answer: B



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26. There is very little difference in acid strength in the series H_3PO_4 , H_3PO_3 and H_2PO_2 because

- A. Phosphorus in these acids exists in different oxidation states
- B. Number of unprotonated oxygen atoms responsible for increase of acidity due to inductive effect remains the same

C. Phosphorus is not highly electronegative element

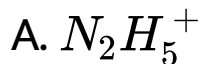
D. Phosphorus oxides are less basic

Answer: B



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27. Which of the following contains a coordinate covalent bond?



B. $BaCl_2$

C. HCl

D. H_2O

Answer: A



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28. White phosphorus when boiled with strong solution of caustic soda produces:

A. Sodium phosphide

B. Sodium phosphate

C. phosphine

D. Red phosphorus

Answer: C



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29. Phosphorous normally exhibits a covalency of ____ and ____ .

A. + 3 and +5

B. + 2 and +3

C. + 1 and +2

D. + 3 and +4

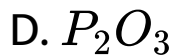
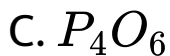
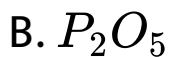
Answer: A



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30. The oxide which is the anhydrate of orthophosphoric acid is

A. P_4O_{10}



Answer: A



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31. Which of the following P is most stable?

A. Red

B. White

C. Black

D. All stable

Answer: C



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32. H_3PO_2 is the molecular formula of an acid of phosphorus. Its name and basicity respectively are

A. Phosphorous acid and two

B. Hypophosphorous acid and two

C. Hypophosphoric acid and two

D. Hypophosphorus acid and two

Answer: C



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33. Phosphorus pentoxide finds use as

A. An oxidising agent

B. A reducing agent

C. A bleaching agent

D. A dehydrating agent

Answer: D



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34. The number of hydroxyl groups in pyrophosphoric

A. 3

B. 4

C. 5

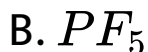
D. 7

Answer: B



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35. Which of the following flourides does not exist?





Answer: A



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36. Which one of the following elements is most metallic?

A. P

B. As

C. Sb

D. Bi

Answer: D



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37. NH_3 has a much higher b.p. than PH_3

because

A. NH_3 has a larger molecular weight

B. NH_3 undergoes umbrella inversion

C. NH_3 forms hydrogen bond

D. NH_3 contains ionic bonds whereas PH_3 contains covalent bonds.

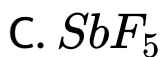
Answer: C



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38. Which one of the following pentafluorides cannot be formed?

A. PF_5



Answer: D



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39. In modern proces, white phosphorus is manufactured by :

- A. Heating a mixture of phosphorite mineral with sand and coke in an electric furnace
- B. Heating calcium phosphate with lime
- C. Heating bone ash with coke
- D. Heating phosphate mineral with sand

Answer: A



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40. The structure of white phosphorus is

A. Square planar

B. Pyramidal

C. Tetrahedral

D. Trigonal planar

Answer: C



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41. When excess of water is added to $BiCl_3$ solution

A. Ionization of $BiCl_3$ is increased

B. A white ppt. of $Bi(OH)_3$ is obtained

C. $BiCl_3$ is hydrolysed to give white ppt. of

$BiOCl$

D. $BiCl_3$ is precipitated

Answer: C



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42. Group 15 of the periodic table consists of the elements N, P, As, Sb and Bi. On passing from N to Bi, the oxides of the elements of general formula M_2O_3 become

A. Stronger reducing agents

B. more ionic

C. more basic

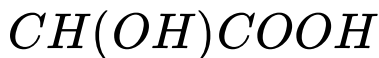
D. more volatile

Answer: C

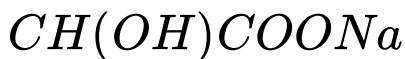
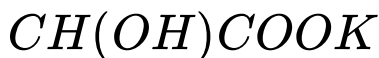


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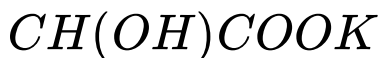
43. The chemical formula for tartermetic is



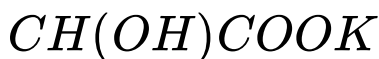
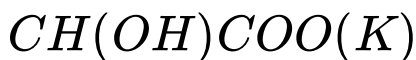
A. |



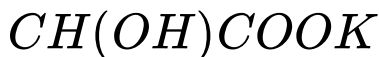
B. |



C. |



D. |



Answer: C



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44. In NH_3 and PH_3 the common is

- A. Odour
- B. Combustiibility
- C. Basic nature
- D. None of these

Answer: C



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45. Which element from group 15 gives most basic compound with hydrogen?

A. Nitrogen

B. Bismuth

C. Arsenic

D. Phosphorus

Answer: A



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

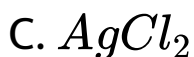
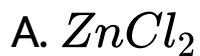
- A. Red phosphorus
- B. White phosphorus
- C. Scarlet Phosphorus
- D. Violet phosphorus

Answer: B



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47. Which element of group 15 undergoes sublimation?



Answer: D



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48. The BCl_3 is a polar molecule whereas NCl_3 is pyramidal because

A. BCl_3 has no lone pair of electrons but

NCl_3 has a lone pair of electrons

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

C. nitrogen atoms is smaller than boron
atom

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

Answer: A



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49. The electronic configuration of an element is $1s^2 1s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^3$. Its properties would be similar to which of the following elements?

A. Boron

B. Oxygen

C. Nitrogen

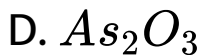
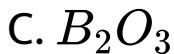
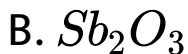
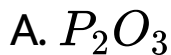
D. Chlorine

Answer: C



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50. The most acidic of the following compounds is



Answer: A



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51. Which of the following halides is the most acidic?

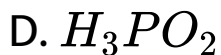
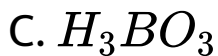
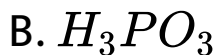
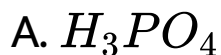


Answer: A



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52. The acid which forms two series of salts is

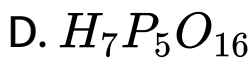
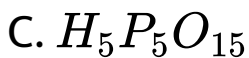
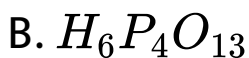
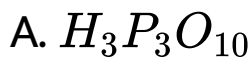


Answer: B



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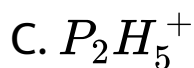
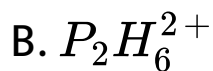
53. Which of the following is a cyclic phosphate?



Answer: C



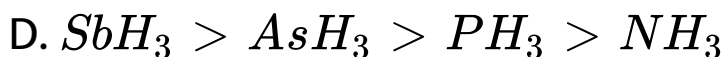
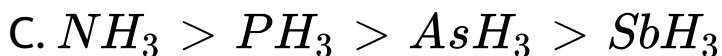
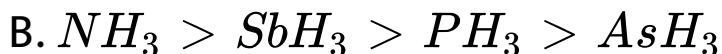
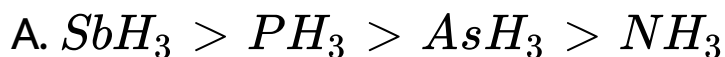
54. Which of the following has least covalent $P - H$ bond



Answer: B



55. The basic character of hydrides of the V-group elements decreases in the order



Answer: C



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56. At. No. of N is 7, the At. No. of the third member of nitrogen family will be

A. 23

B. 15

C. 33

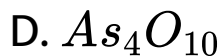
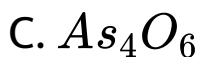
D. 43

Answer: C



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57. Which of the following oxides will be the least acidic?

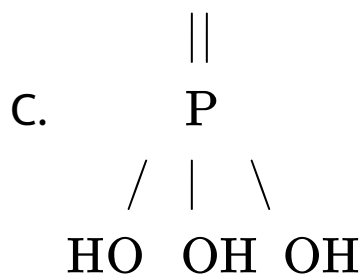
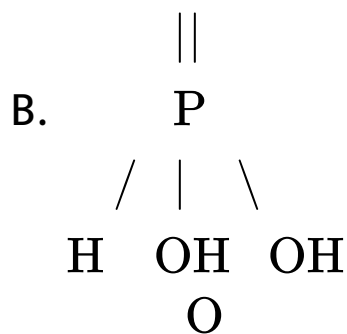
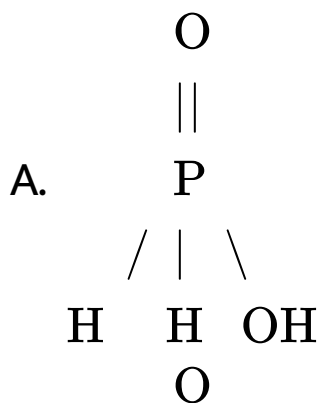


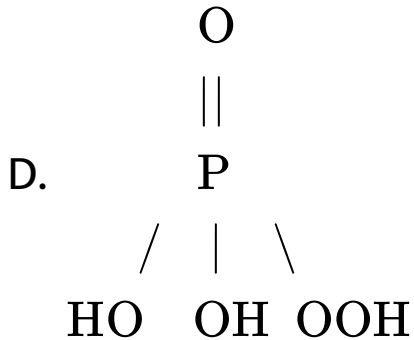
Answer: C



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58. the correct structural formula of hypophosphorous acid is





Answer: A



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59. Which of the following compounds does not exist ?





Answer: C



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60. In Nitrogen family the H-M-H angle in the hydrides MH_3 gradually becomes closer to 90° on going from N to Sb. This due to

A. The basic strength of the hydrides increases

B. Almost pure p - orbital are used for M - H bonding

C. The bond energies of M - H bonds increase

D. The bond pairs of electrons became nearer to the central atom

Answer: B



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61. In PO_4^{3-} the formal charge on each O-atom and $P - O$ bond order respectively are .

A. $-0.75, 1.25$

B. $-3, 1.25$

C. $-0.75, 1.0$

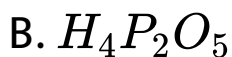
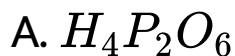
D. $-0.75, 0.6$

Answer: A



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62. P-O-P bond is present in



C. both (A) and B

D. None of these

Answer: B



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63. Which of the following is the correct statement for PH_3 ?

A. It is less basic than NH_3

B. It is less poisonous than NH_3

C. Electronegativity of $PH_3 > NH_3$

D. It does not show reducing properties.

Answer: A



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64. The equivalent weight of phosphoric acid (H_3PO_4) in the reaction

A. 25

B. 49

C. 49

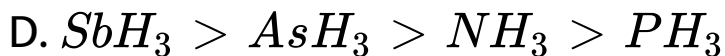
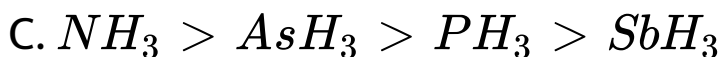
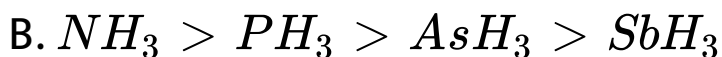
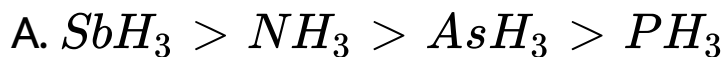
D. 98

Answer: D



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65. Boiling/melting points of the following hydrides follow in order.



Answer: A



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

A. Hypophosphorus acid

B. Orthophosphoric acid

C. Pyrophosphoric acid

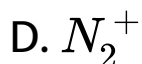
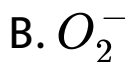
D. Metephosphoric acid

Answer: A



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67. Which of the following species is isoelectronic with CO?



Answer: A



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68. Which oxide of nitrogen is obtained on heating ammonium nitrate at $250^{\circ}C$?

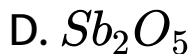
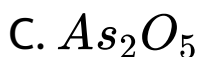
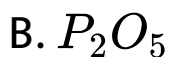
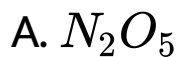
- A. Nitric oxide
- B. Nitrous oxide
- C. Nitrogen dioxide
- D. Dinitrogen tetraoxide

Answer: B



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69. Which of the following oxides is the most acidic?



Answer: A



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70. Orthophosphoric acid is

A. Monobasic

B. Dibasic

C. Tribasic

D. Tetrabasic

Answer: C



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71. What is hybridization of P in PCl_5 ?

A. sp^3

B. $sp^3 d^5$

C. $sp^3 d$

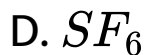
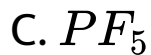
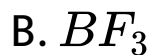
D. sp^2

Answer: C



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72. Which one of the following molecules will have unequal bond lengths ?

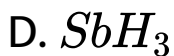
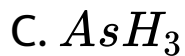


Answer: C



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73. Which of the following has highest dipole moment?



Answer: A



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74. Which of the following molecules is linear?





Answer: B



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75. Which of the following is least basic?



C. NCl_3

D. NI_3

Answer: A



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76. White phosphorus is

A. A monoatomic gas

B. P_4 , a tetrahedral solid

C. P_8 , a crown

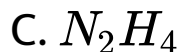
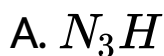
D. A linear diatomic molecules

Answer: B



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



D. NH_3

Answer: A



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78. Molecular nitrogen is very inert chemically.

Why ?

A. Multiple bond formation in the molecule

B. Absence of bond polarity

C. Short internuclear distance

D. High bond energy

Answer: D



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79. Which of the following compounds is explosive in nature?

A. Phosphorus trichloride

B. Nitrogen trichloride

C. Hyponitrous acid

D. Nitrosyl chloride

Answer: B



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80. HNO_2 acts as an/a

A. Acid

B. Oxidising agent

C. Reducing agent

D. All the above

Answer: D



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81. Which one of the following oxides of nitrogen is blue solid?

A. NO

B. N_2O_3

C. N_2O

D. N_2O_5

Answer: B



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82. When ammonia is heated with cupric oxide, a molecule of ammonia will

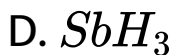
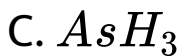
- A. Gain 3 electrons
- B. Lose 3 electrons
- C. Gain 2 electrons
- D. Lose 2 electrons

Answer: B



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83. Which has the lowest boiling point?



Answer: B



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84. The basicity of phosphorus acid (H_3PO_3) is _____ .

A. 1

B. 2

C. 3

D. 4

Answer: B



85. Nitrogen forms N_2 but phosphorous when forms P_2 gets readily converted into P_4 because

- A. triple bond is present between phosphorus atoms
- B. $p\pi - d\pi$ bonding is weak
- C. $p\pi - p\pi$ bonding is strong
- D. multiple bond is formed easily.

Answer: B



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86. P_4O_{10} is not used to dry NH_3 gas because

A. P_4O_{10} reacts with moisture in NH_3

B. P_4O_{10} is not a drying agent

C. P_4O_{10} is acidic and NH_3 is basic

D. P_4O_{10} is basic and NH_3 is acidic

Answer: C



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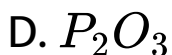
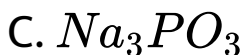
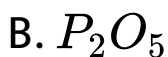
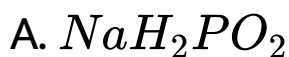
87. In which of the following bond angle is maximum



Answer: B



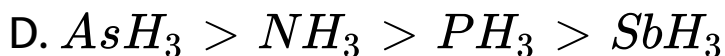
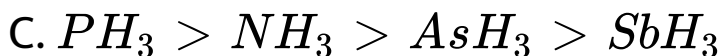
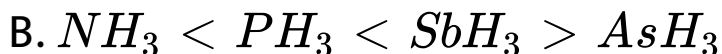
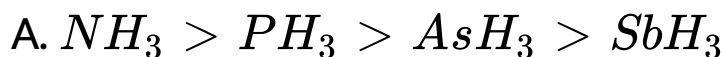
88. Aqueous sodium hydroxide reacts with white phosphorus to form phosphine and



Answer: A



89. The stability of the hydrides follows the order



Answer: A



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90. Which one of the following arrangements of molecules is correct on the basis of their dipole moments?

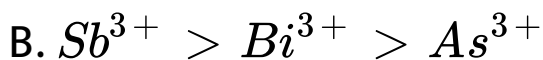


Answer: D



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91. Ionic radii (in Å...) of As^{3+} , Sb^{3+} and Bi^{3+} follow the order



Answer: D



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92. The trade name of sodium hexametaphosphate is_____.

A. Calgon

B. Permutit

C. Natalite

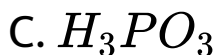
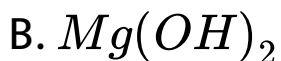
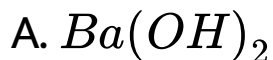
D. Nitrolim

Answer: A



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93. Which one of the following is an oxyacid ?



Answer: C



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94. The explanation for the presence of three unpaired electrons in the nitrogen atom can be given by -

A. Heisenberg ' s uncertainty principle

B. Aufbau ' s rule

C. Pauli ' exclusion law

D. Hund ' s rule

Answer: D



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95. When an excess of chlorine is treated with ammonia, the products formed are

- A. N_2 and NCl_3
- B. N_2 and HCl
- C. N_2 and NH_4Cl
- D. NCl_3 and HCl

Answer: D



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96. The three important oxidation states of phosphorus are

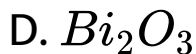
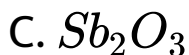
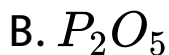
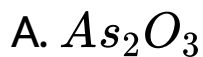
- A. $-3, +3$ and $+5$
- B. $-3, +3$ and -5
- C. $-3, +4$ and -4
- D. $-3, +3$ and $+4$

Answer: A



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97. Of the following compounds, the most acidic is



Answer: B



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98. Which one of the following elements is most metallic?

A. P

B. As

C. Sb

D. Bi

Answer: D



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99. Number of sigma bonds in P_4O_{10} is :

A. 6

B. 16

C. 20

D. 7

Answer: B



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100. In NO_3^- ion, the number of bond pair and lone pair of electrons on N-atom are :

A. 2 , 2

B. 3 , 1

C. 1 , 3

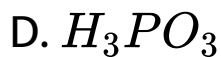
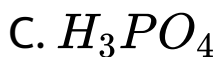
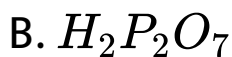
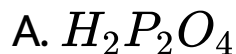
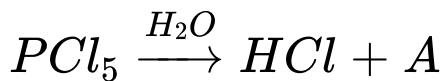
D. 4 , 0

Answer: D



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101. In the following reaction



Answer: C



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102. PH_3 , the hydride of phosphorus is

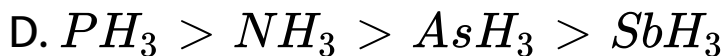
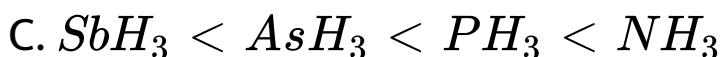
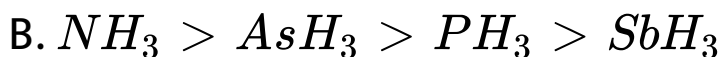
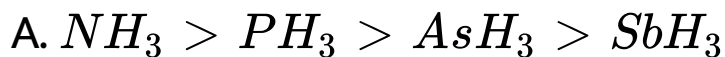
- A. Metallic
- B. Ionic
- C. Non - Metallic
- D. Covalent

Answer: D



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103. The correct sequence of decrease in the bond angles of the following hydrides is

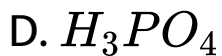
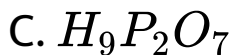
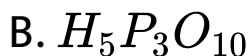
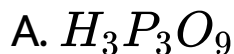


Answer: A



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104. Which of the following is metaphosphoric acid?

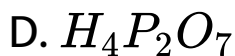
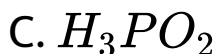
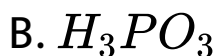


Answer: A



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105. Which of the following oxyacids of phosphorus is a reducing agent and monobasic?

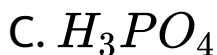
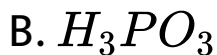
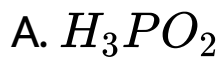


Answer: C



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106. Which of the following compound is tribasic acid?



Answer: C



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107. What is the hybridisation state of the central atom in the conjugate base of NH_4^+ ion?

A. sp

B. sp^3

C. sp^2

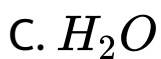
D. dsp^2

Answer: B



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108. The largest bond angle in



Answer: B



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109. Which of the following non-metal possess the atomicity half that of sulphur?

A. Nitrogen

B. oxygen

C. Phosphorus

D. arsenic

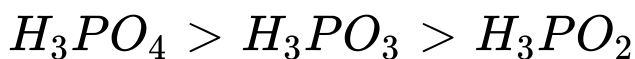
Answer: C



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110. The true statement of the acids of phosphorus H_3PO_2 , H_3PO_3 and H_3PO_4 is

A. The order of their acidity is



B. All of them are reducing in nature

C. All of them are tribasic acids

D. The geometry of phosphorus is tetrahedral in all the three.

Answer: D



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111. Which of the following is used to produce smoke screens?

- A. Sodium chloride
- B. Zinc phosphate
- C. Calcium phosphide
- D. Calcium fluoride

Answer: C



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112. Nitrogen shows different oxidation states in the range:

A. 0 to +5

B. - 3 to +5

C. - 5 to +3

D. - 3 to +3

Answer: B



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113. An example of a natural oxide is

A. NO

B. CO_2

C. CaO

D. ZnO

Answer: A



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114. H_3PO_3 , phosphorus acid is

- A. a diprotic acid
- B. a triprotic acid
- C. a monoprotic acid
- D. not acidic

Answer: A



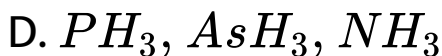
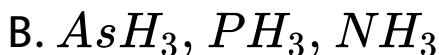
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115. N_2 forms NCl_3 whereas P can form both PCl_3 and PCl_5 . Why ?

- A. P has low lying 3d - orbitals , which can be used for bonding but N does not have 3d - orbitals in its valence shell
- B. N atoms is larger than P in size
- C. P is more reactive towards Cl than N
- D. None of these

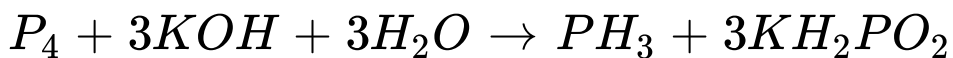
Answer: A

116. Which of the following is the correct order of increasing enthalpy of vaporisation ?



Answer: D

117. In the reaction



A. Reduced

B. Oxidised

C. Oxidised and reduced

D. Neither oxidized nor reduced

Answer: B



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118. The reaction of calcined phosphate rock with coke and sand in an electric arc furnace at 1773 K gives a number of products including

- A. Phosphorus
- B. Silicon
- C. Calcium hydride
- D. Calcium oxide

Answer: A



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119. Which of the following is not correct?

A. Hydrolysis of NCl_3 gives NH_3 and HOCl

B. NH_3 is less stable than PH_3

C. NH_3 is weak reducing agent compared to PH_3

D. Nitric oxide in solid state exhibits diamagnetism.

Answer: B



120. The number of hydrogen atom(s) attached to phosphorus atom in hypophosphorus acid is

- A. Zero
- B. two
- C. one
- D. three

Answer: B



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121. 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

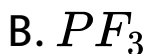
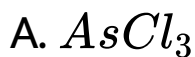
D. 6 , 5

Answer: A



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122. Which of the following is not hydrolysed



Answer: D



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123. Which statement is wrong for NO ?

A. It is anhydrous 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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124. Which of the following metal Fe, Zn, Pb, Ag and Pt do not give a metal nitrate on treatment with concentrated HNO_3 ?

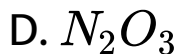
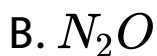
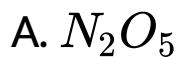
- A. Fe and zn
- B. Fe and Pt
- C. Pb , Ag and Pt
- D. Fe,Zn and Pt.

Answer: B



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125. Which of the following oxides of nitrogen is thermally most stable



Answer: C



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126. Correct formula of the complex formed in the brown ring test for nitrates is

- A. The reduction of nitrate to nitric oxide
- B. Oxidation
- C. of nitric oxide to nitrogen dioxide
- D. reduction of ferrous sulphide to iron

Answer: A



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127. The decreasing order of the boiling points of the following hydrides

(i) NH_3 (ii) PH_3

(iii) AsH_3 (iv) SbH_3

(v) H_2O is

A. $V > IV > III > II$

B. $V > II > III > IV$

C. $I > IV > III > II > V$

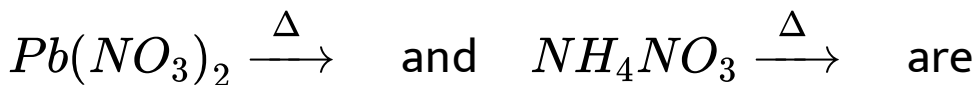
D. $IV > III > II > I > V$

Answer: A

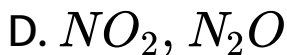
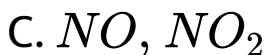
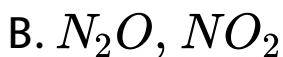
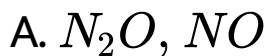


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128. The gases produced in the reaction



respectively



Answer: D



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129. Nitrogen forms a variety of compounds in all oxidation states ranging from:

A. -3 to $+5$

B. -3 to $+3$

C. -3 to $+4$

D. -3 to $+6$

Answer: A



130. Which of the following form acidic halides

A. HF

B. HCl

C. HBr

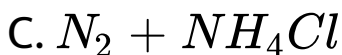
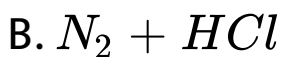
D. HI

Answer: D



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131. Chlorine reacts with excess of ammonia to form.

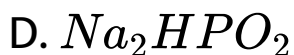
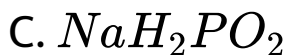
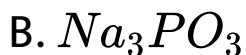
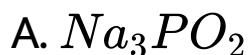


Answer: C



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132. The correct formula of salt formed by the neutralization hypophosphorus acid with NaOH is



Answer: C



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133. Reaction of HNO_3 with C,P,S and I respectively give

A. HIO_3 , H_2SO_4 , H_3PO_4 and CO_2

B. HIO_3 , H_2SO_4 , H_3PO_4 and CO_2

C. I_2O_5 , H_2SO_4 , H_3PO_3 and CO

D. I_2O_5 , SO_2 , P_2O_5 and CO_2

Answer: A



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134. Excess of PCl_5 reacts with *conc.* H_2SO_4

gives

- A. sulphuryl chloride
- B. sulphur dioxide
- C. chlorosulphuric acid
- D. thionyl chloride

Answer: A



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135. The incorrect statements among the following is/are

(I) NCl_5 does not exist while PCl_5 does (II)

Lead prefers to form tetravalent compounds

in the carbonate ion (III) The three C-O bonds

are not equal in the carbonate ion (IV) Both

O_2^+ and NO are paramagnetic

A. I, III, and IV

B. I and IV

C. II and III

D. I and III

Answer: C



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136. $Cl - P - Cl$ bond angles in PCl_5 molecule are

A. 120° and 190°

B. 60° and 90°

C. 60° and 120°

D. 120° and 30°

Answer: A



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137. Nitrate is confirmed by ring test. The brown colour of the ring is due to formation of

A. mixture of NO and NO_2

B. nitrosoferrous sulphate

C. ferrous nitrate

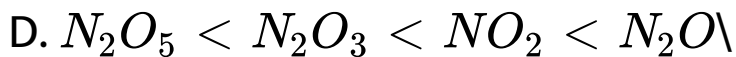
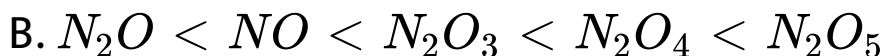
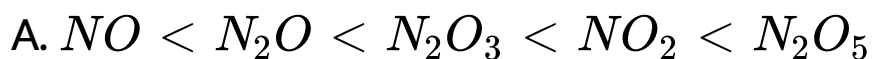
D. ferric nitrate

Answer: B



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

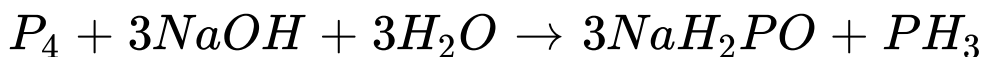


Answer: B



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139. The reaction



is an example of.

A. Disphorportionation reaction

B. Netralization rection

C. Double decomposition

D. reaction

Answer: A



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140. The reaction of P with X leads selectively to P_4O_6 . 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 aqua.

Answer: B



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141. Atoms in P_4 molecule 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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142. Which of the following has the highest proton affinity ?

A. Stibine (SbH_3)

B. Arsine (AsH_3)

C. Phosphine (PH_3)

D. Ammonia (NH_3)

Answer: D

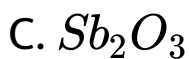


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143. Out of the following compounds the most acidic is

A. As_2O_3

B. P_2O_3



Answer: B



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144. 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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145. 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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146. The bonds present in N_2O_5 are

A. Only covalent

B. Only ionic

C. Covalent and Co - ordinate

D. Covalent and ionic

Answer: C



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147. How many bridging oxygen atom are present in P_4O_{10} ?

A. 6

B. 4

C. 2

D. 5

Answer: A



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148. Which of the following contains P-O-P bond?

A. Hypophosphorus acid

B. phosphorus acid

C. Pyrophosphoric acid

D. Ortho phosphoric acid

Answer: C



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149. The oxidation states of P in $H_4P_2O_5$, $H_4P_2O_6$ and $H_2P_2O_7$ are respectively

A. + 3,+4,+5

B. + 3,+5,+4

C. + 5,+3,+4

D. + 5,+4,+3

Answer: A



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150. The hydrolysis of NCl_3 by H_2O produces

A. $NHOH$ and $HOCl$

B. NH_2NH_2 and HCl

C. NH_4OH and HOCl

D. NH_4Cl and HOCl

Answer: C

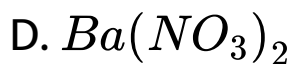
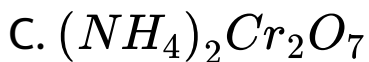


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151. Extra pure N_2 can be obtained by heating

A. NH_3 and CuO

B. NH_4NO_3



Answer: D



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152. Which of the following is wrong

A. Nitrogen cannot form $d\pi - d\pi$ bond

B. single N-N bond is weaker than the
single P-P bond

C. N_2O_4 has two resonance structures.

D. The stability of hydrides increases from

NH_3 to BiH_3

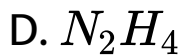
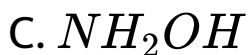
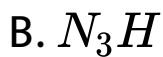
Answer: D



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153. In which of the following compounds nitrogen exhibits highest oxidation state

A. NH_3



Answer: B



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154. Which order of the compounds is according to the decreasing order of 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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155. O.N of P in $(HPO_3)_3$ is

A. 1

B. 2

C. 3

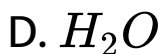
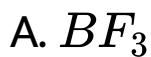
D. 5

Answer: D



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156. Which of the following species contains three bond pairs and one lone pair around the central atom?



Answer: C



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157. Which of the following statement is not valid for oxoacids of phosphorus?

A. Hypo phosphorous acid is a diprotic acid

B. all oxoacids contain

C. tetrahedral four coordinated

phosphorus

D. All oxoacids of phosphorus contain at

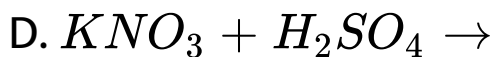
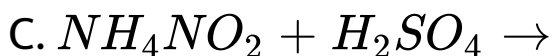
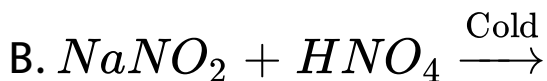
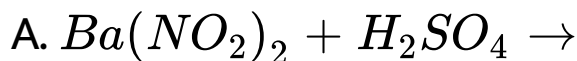
least one P=O unit and one P - OH unit

Answer: A



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158. an aqueous solution of HNO_2 (nitrous acid), free of salt can be obtained from the reaction



Answer: A



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159. α and β forms of sulphur are at equilibrium at a temperature known as

- A. critical temperature
- B. transition temperature
- C. Boyle temperature
- D. Inversion temperature

Answer: B



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160. Which one statement about SO_2 is incorrect

A. It has an angular shape

B. It decolourises potassium permanganate solution

C. Two S - O bonds one equal

D. It is a dehydrating agent

Answer: D



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161. Which of the following statement regarding ozone is incorrect

A. The ozone molecule is angular in shape

B. The ozone is resonance structure of two structures

C. The oxygen-oxygen bond length in ozone is equal to that of oxygen molecule

D. Ozone is used as a germicide and disinfectant for air.

Answer: C



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162. How many bridging oxygen atom are present in P_4O_{10} ?

A. 6

B. 4

C. 2

D. 5

Answer: A



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163. Which of the following statements about liquid nitrogen is true

A. It is unreactive

B. It is used in cryo surgery

C. It does not decompose organic compounds

D. It is very stable

Answer: B



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164. What type of structure does $(NPS_2)_4$ have

A. Linear

B. Hexagonal

C. Cyclic

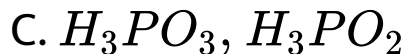
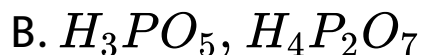
D. Polymeric

Answer: C



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165. Which pair of oxyacids of phosphorus contain P-H bonds



D. H_3PO_2 , HPO_3

Answer: C



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Selected straight objective type

1. Which of the following can act as a Lewis base?

A. NCl_3



Answer: A::D



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2. Which of the following can act as a Lewis base?



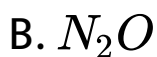


Answer: A::B::C::D



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3. Which of the following oxides are acidic?



C. NO_2

D. N_2O_5

Answer: C::D



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4. What is not true about PH_3 ?

A. It turns red litmus blue

B. it reacts with HCl (aq) to give PH_4Cl

C. It reacts with HBr (aq) to give PH_4Br

D. It reacts with HI (aq) to give PH_4I .

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



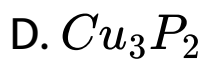
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5. Which of the following will be decomposed by water to give PH_3 ?

A. AlP

B. Ca_3P_2

C. PH_4Cl

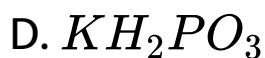
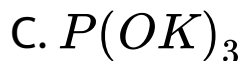
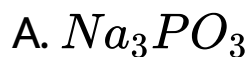


Answer: A::B::C



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6. Which of the following does not exist?

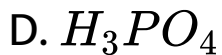
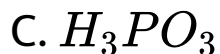


Answer: A::C



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7. Yellow phosphorus reacts with $CuSO_4$ solution to give



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



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8. Yellow phosphorus does not glow in (all gases at one atmospheric pressure)

A. air

B. air + SO_2

C. pure O_2

D. air+terpentine vapour

Answer: B::C::D



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9. Nitrozen (i) oxide is produced by

A. thermal decomposition of ammonium nitrate

B. disproportionation of N_2O_4

C. thermal decomposition of ammonium nitrite

D. Interaction of hydroxylamine and nitrous acid.

Answer: A::D



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10. White phosphorus (P_4) has

A. six P-P sigma bonds

B. four P-P single bonds

C. four lone pairs of electrons

D. P-P-P angle of 60°

Answer: A::C::D



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11. When 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. Oxidation and reduction

D. Neutralisation

Answer: C

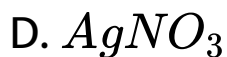
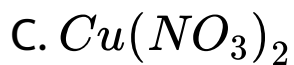


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12. Which of the following does not give NO_2 on heating?

A. KNO_3

B. $Pb(NO_3)_2$



Answer: A



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13. A gas that cannot be collected over water is.



C. SO_2

D. PH_3

Answer: C



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14. Bonds present in N_2O_5 are.

A. only ionic

B. covalent and coordinate

C. only covalent

D. covalent ionic

Answer: B



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15. The electronegativity of the following elements increases in the order

A. C , N , Si , P

B. N , Si , C , P

C. Si , P , C , N

D. P , Si , N , C

Answer: C



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16. Which of the following oxide of nitrogen is a coloured gas?

A. N_2O

B. NO

C. N_2O_4

D. NO_2

Answer: D



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

A. NF_3

B. NCl_3

C. NBr_3

D. NI_3

Answer: A



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18. The lightning bolts in the atmosphere causes the formation of nitric oxide.

A. NO

B. NH_3

C. NH_4OH

D. NH_2OH

Answer: A



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19. Concentrated HNO_3 reacts with iodine to give:

A. HI

B. HOI

C. $HOIO_2$

D. $HOIO_3$

Answer: C



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20. Which one of the following is the strongest base ?

A. AsH_3

B. NH_3

C. PH_3

D. SbH_3

Answer: B



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21. The oxidation state of phosphorus in

$Ba(H_2PO_2)_2$ is

A. 3

B. 2

C. 1

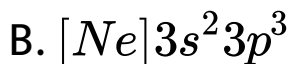
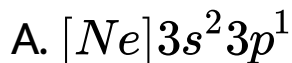
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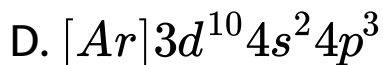
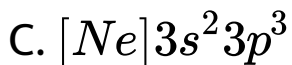
Answer: C



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22. Amongst the following elements whose electronic configuration are given below, the one having the highest enthalpy is





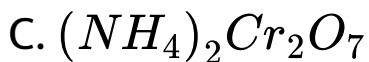
Answer: B



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23. Nitrogen is liberated by the thermal decomposition of only





D. All the three.

Answer: D



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24. The cyanide ion CN and N_2 are isoelectronic, but in contrast to CN^- , N_2 is chemically inert, because of

A. low bond energy

B. Absence of bond polarity

C. unsymmetrical electron distribution

D. Presence of more number of electrons in bonding orbitals

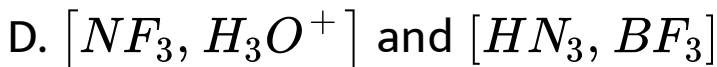
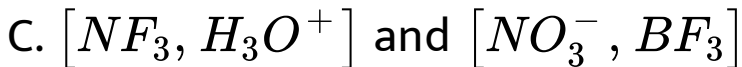
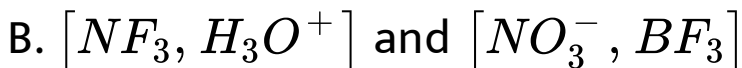
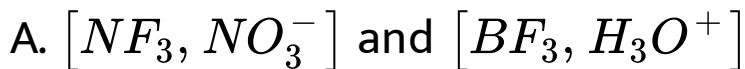
Answer: B



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25. Among the following species, identify the isostuctural pairs





Answer: C



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26. In nitroprusside ion, the iron and NO exist as $Fe(II)$ and NO^+ rather than Fe^{III} and NO . These forms can be differentiated by

A. Estimating the concentration of iron

B. Measuring the concentration of iron

C. Measuring the solid state magnetic moment

D. Thermally decomposing the compound

Answer: C



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27. On heating ammonium dichromate, the gas evolved is :

A. Oxygen

B. ammonia

C. nitrous oxide

D. nitrogen

Answer: D



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28. One mole of calcium phosphine on reaction with excess of water gives

- A. One mole of phosphine
- B. Two moles of phosphoric acid
- C. Two moles of phosphine
- D. One mole of phosphorus oxide

Answer: C



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29. The number of $P - O - P$ bonds in cyclic metaphosphoric acid is.

A. Zero

B. Two

C. Three

D. Four

Answer: C



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30. Ammonia can be dried by :

A. Conc. H_2SO_4

B. P_4O_{10}

C. CaO

D. Anhy. $CaCl_2$

Answer: C



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31. The hybridisation of atomic orbitals of nitrogen in NO_2^+ , NO_3^- and NH_4^+ are :

A. sp , sp^3 and sp^2 respectively

B. sp , sp^2 and sp^3 respectively

C. sp^2 , sp and sp^3 respectively

D. sp^2 , sp^3 and sp respectively.

Answer: B



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32. For H_3PO_3 and H_3PO_4 , the correct choice is

- A. H_3PO_3 is dibasic and reducing
- B. H_3PO_3 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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33. Which is the most thermodynamically stable allotropic form of phosphorus ?

A. red

B. white

C. black

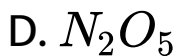
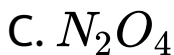
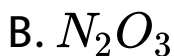
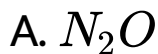
D. yellow

Answer: C



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34. Which blue liquid is obtained on reacting equimolar amounts of two gases at $-30^{\circ}C$?



Answer: B



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

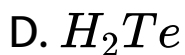
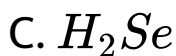


Answer: A



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36. Which of the following has the least bond angle?



Answer: D



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



Answer: D



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Linked comprehension

1. There are several forms of solid phosphorus but only red and white forms are important. The white phosphorus consists of discrete tetrahedral P_4 molecules. The structure of red phosphorus has not yet been completely determined but there are evidences that it is polymeric and consists of chains of P_4 tetrahedral linked together. at room temperature , stable modification of elements phosphorus is red form. because of its highly

polymerised structure, it is less volatile and less reactive than white phosphorus. In most of its compounds, phosphorus can have a valency of 3 or 5. Phosphorus acid is peculiar because although it contains three hydrogen atoms per molecule, only two dissociate.

It is easier to handle red phosphorus than white phosphorus in air at room temperature because

A. it does not melt

B. it has polymeric structure

C. a protective coating of an oxide is formed on the surface

D. it slowly reacts with atmospheric moisture to form phosphoric acid

Answer: B



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2. There are several forms of solid phosphorus but only red and white forms are important. The white phosphorus consists of discrete

tetrahedral P_4 molecules. The structure of red phosphorus has not yet been completely determined but there are evidences that it is polymeric and consists of chains of P_4 tetrahedral linked together. at room temperature , stable modification of elements phosphorus is red form. because of its highly polymerised structure, it is less volatile and less reactive than white phosphorus. in most of its compounds, phosphorus can have a valency of 3 or 5. phosphorus acid is peculiar because although it contains three hydrogen atoms per molecule, only two dissociation.

When P is burnt in excess of O_2 , a compound is obtained in which each molecules contains

- A. four atoms of P and six atoms of O
- B. four atoms of P and ten
- C. atoms of O
- D. two atoms of P and three atoms of O

Answer: B



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3. There are several forms of solid phosphorus but only red and white forms are important. The white phosphorus consists of discrete tetrahedral P_4 molecules. The structure of red phosphorus has not yet been completely determined but there are evidences that it is polymeric and consists of chains of P_4 tetrahedral linked together. at room temperature , stable modification of elements phosphorus is red form. because of its highly polymerised structure, it is less volatile and less reactive than white phosphorus. in most

of its compounds, phosphorus can have a valency of 3 or 5. phosphorus acid is peculiar because although it contains three hydrogen atoms per molecule, only two dissociation.

The two hydrogen atoms of phosphorus acid are acidic because.

A. All the hydrogen atoms are attached to
phosphorus

B. All the hydrohen atoms are attached to
oxygen

C. two hydrogen atoms are attached to oxygen

D. two hydrogen atoms are attached to phosphorus

Answer: C



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Matrix

1. Here each question contains statements given in two column which have to be matched. Statements in column I are labelled as A,B ,C and D where as the statements in column II are labelled p,q,r and s. the answer to these question are to be appropriately bubbled as illustrated in the following example.

If the correct matches should like the following

	<i>p</i>	<i>q</i>	<i>r</i>	<i>s</i>
(A)	●	○	○	●
(B)	○	●	●	○
(C)	●	●	○	○
(D)	●	○	○	○

Column I

- (A) $\text{Cu} + \text{dil HNO}_3$
 (B) $\text{Cu} + \text{Conc. HNO}_3$
 (C) $\text{Zn} + \text{dil. HNO}_3$
 (D) $\text{Zn} + \text{conc. HNO}_3$

Column II

- (*p*) NO
 (*q*) NO_2
 (*r*) N_2O
 (*s*) $\text{Cu}(\text{NO}_3)_2$
 (*i*) $\text{Zn}(\text{NO}_3)_2$



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2. Here each question contains statements given in two columns which have to be matched. Statements in column I are labelled as A, B, C and D whereas the statements in column II are labelled p, q, r and s. The answers to these questions are to be appropriately bubbled as illustrated in the following example.

If the correct matches should be like the following

	<i>p</i>	<i>q</i>	<i>r</i>	<i>s</i>
(A)	●	○	○	●
(B)	○	●	●	○
(C)	●	●	○	○
(D)	●	○	○	○

Column I

Column II

- (A) $\text{H}_3\text{PO}_3 \xrightarrow{\Delta}$ (*p*) one of products acts as reducing agent
- (B) $\text{PCl}_3 + \text{H}_2\text{O} \xrightarrow{\Delta}$ (*q*) one of the products is a tribasic non reducing agent
- (C) $\text{NO}_2 + \text{H}_2\text{O} \longrightarrow$ (*r*) Dehydration
- (D) $\text{HNO}_3 + \text{P}_4\text{O}_{10} \xrightarrow{\Delta}$ (*s*) In one of the products, central atom has + 5 oxidation state



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Integer

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



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2. The basicity of hypophosphorus acid is



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3. Find the number of metals which are commercially reduced by self-reduction from the given metals :

Fe, Al, Z, Sn, Pb, Hg, Cu.



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4. The total number of the oxidation states of P in compounds obtained on diproportionation of phosphorus acid is.....



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Assertion and reason

1. Assertion : H_3PO_2 is a diacidic acid.

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

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is false

C. A is true but R is false

D. A is false but R is true

Answer: D



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2. Assertion : H_3PO_3 is a diacidic acid.

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

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is false

C. A is true but R is false

D. A is false but R is true

Answer: C



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3. Assertion : PCl_5 is covalent in gaseous and liquid state but ionic in solid state.

Reason: PCl_5 in solid state consists of

tetrahedral PCl_4^+ cation and octahedral PCl_6^- anion.

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true but R is false
- C. A is true but R is false
- D. A is false but R is true

Answer: A



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4. Assertion : white phosphorus is more reactive than red phosphorus

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

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is false

C. A is true but R is false

D. A is false but R is true

Answer: A



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5. Assertion : HNO_3 is a stronger acid than HNO_2

Reason: In HNO_3 , there are two nitrogen to oxygen bonds while in HNO_2 there is only one.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is false

C. A is true but R is false

D. A is false but R is true

Answer: A



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6. Assertion : PF_3 behaves as a lewis acid.

Reason: PF_3 has a pyramidal structure .

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is false

C. A is true but R is false

D. A is false but R is true

Answer: B



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7. Assertion : White phosphorus is stored under water.

Reason: White phosphorus is highly reactive and get oxidised on coming in contact with air.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is false

C. A is true but R is false

D. A is false but R is true

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. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true but R is false
- C. A is true but R is false

D. A is false but R is true

Answer: A



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9. Assertion : Among the hydrides of N-family ,
 NH_3 has highest boiling point .

Reason: Extensive H-bonding is present in
 NH_3 , while other elements of the group can
not form H-bonding.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is false

C. A is true but R is false

D. A is false but R is true

Answer: D



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10. Assertion : NH_3 is less basic than PH_3

Reason: Nitrogen is more electronegative than phosphorus.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is false

C. A is true but R is false

D. Both A and R are false.

Answer: D





11. Assertion : Between $SiCl_4$ and CCl_4 only $SiCl_4$ reacts with water.

Reason : $SiCl_4$ is ionic and CCl_4 is covalent.

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true but R is false
- C. A is true but R is false
- D. A is false but R is true

Answer: C



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12. Assertion : Nitrogen is less reactive than molecular oxygen.

Reason: Bond length of N_2 is shorter than that of oxygen.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is false

C. A is true but R is false

D. A is false but R is true

Answer: A



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Ultimate

1. Ordinary phosphine is spontaneously inflammable due to the presence of

A. vapours of P_4

B. vapours of P_2H_6

C. vapours of P_2H_4

D. none of these

Answer: C



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2. The trihalide of nitrogen with highest dipole moment is



Answer: D



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3. In the compounds of the type POX_3 , P atoms show multiple bonding of the type

A. $p\pi - d\pi$

B. $d\pi - d\pi$

C. $p\pi - d\pi$

D. none of these

Answer: C



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4. SbF_3 a fluorinating agent for non-metal compounds is called

A. Tartaremetic

B. Swarts reagent

C. Tollen's reagent

D. Nessler's reagent

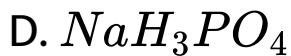
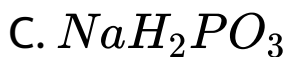
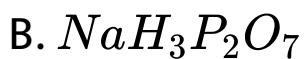
Answer: B



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5. Which of the following does not exist ?

A. NaH_2PO_2



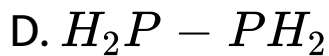
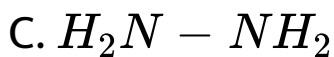
Answer: B



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6. Which of the following has no basic properties ?



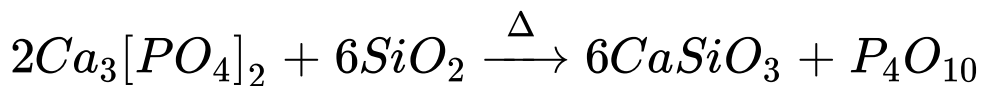


Answer: D



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7. In the reaction



A. a weaker acid anhydride replaces a stronger one

B. a stronger acid anhydride replaces a weaker one

C. both acid anhydrides have equal strength

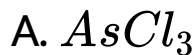
D. none of these

Answer: A



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8. Which of the following is not soluble in excess of water ?



D. both (B) and (C)

Answer: D



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9. From a mixture of yellow P and red P, yellow P can be removed by

A. heating with conc. H_2SO_4

B. heating with conc. HNO_3

C. heating with NaOH (aq)

D. none of these

Answer: C



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10. Na_2HPO_4 solution in water is

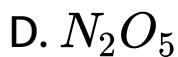
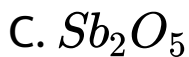
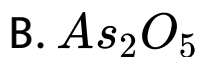
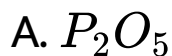
- A. acidic in nature
- B. neutral
- C. slightly alkaline
- D. strongly alkaline

Answer: C



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11. The most stable pentaoxide is



Answer: A



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12. In N_2O_5 valence of nitrogen is

A. 2

B. 3

C. 4

D. 5

Answer: B



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13. Some KH_2PO_2 is dissolved in D_2O . The resulting solution is dried. The residue obtained contains

A. Only KH_2PO_2

B. only KD_2PO_2

C. $KDHPO_2$ and KH_2PO_2

D. $KDHPO_2$ and $KDPO_2$

Answer: A



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14. Doping Si or Ge with As or P will produce

A. p-type semiconductor Ge and n-type semiconductor Si

B. n-type semiconductor Ge and p-type semiconductor Si

C. n-type semiconductor Ge and n-type semiconductor Si

D. p-type semiconductor Ge and p-type semiconductor Si.

Answer: C



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