



CHEMISTRY

BOOKS - MHTCET PREVIOUS YEAR PAPERS AND PRACTICE PAPERS

P-BLOCK ELEMENTS

Exercise 1

1. The statement that is not correct is

A. hypophosphorous acid reduces silver nitrate to
silver

B. in solid state PCl_5 exists as $[PCl_4]^+ [PCl_6]^-$

C. pure phosphine is non-inflammable

D. phosphorous acid on heating disproportionates
to give metaphosphoric acid and phosphine

Answer: C



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2. The species that is not hydrolysed in water is

A. P_5O_{10}

B. BaO_2

C. Mg_3N_2

D. CaC_2

Answer: A



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3. The mixture of concentrated HCl and HNO_3 made in 3:1 ratio contains

A. ClO_2

B. $NOCl$

C. NCl_3

D. N_2O_4

Answer: B



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4. Maximum bond angle at nitrogen is present in which of the following ?



Answer: C



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5. A neutral fertilizer among the following is

A. CAN

B. ammonium sulphate

C. ammonium nitrate

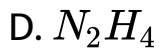
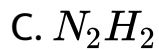
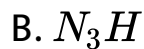
D. urea

Answer: A



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6. A hydride of nitrogen which is acidic in nature is :

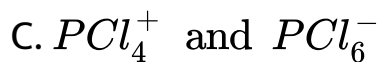


Answer: B



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7. Solid PCl_5 exists as



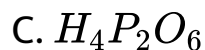


Answer: C



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8. Which of the following compound has a P-P bond ?

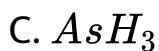


Answer: C



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9. The least stable hydride is



Answer: D



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10. The structural formula of hypophosphorous acid is

A. 

B. 

C. 

D. 

Answer: A



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11. Which element is used in the preparation of pesticides ?

A. Arsenic

B. Bismuth

C. Antimony

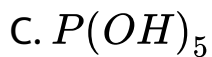
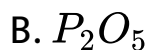
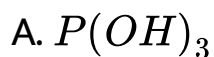
D. Nitrogen

Answer: A



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12. The reaction of P_4 with aqueous NaOH gives



Answer: D



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13. Which one of the following pairs is obtained on heating ammonium dichromate ?

A. N_2 and H_2O

B. N_2O and H_2O

C. NO_2 and H_2O

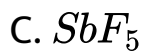
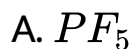
D. NO and NO_2

Answer: A



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

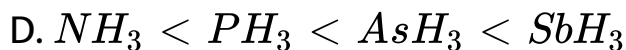
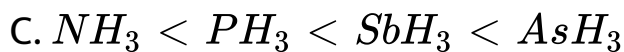
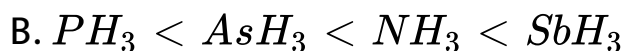
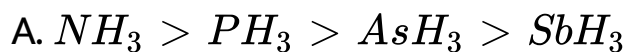


Answer: D



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15. The correct order of boiling point of the hydrides of nitrogen family of

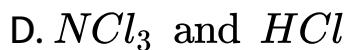
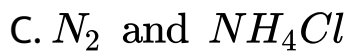


Answer: B



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



Answer: D



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17. The decreasing value of bond angles from $NH_3(106^\circ)$ to $SbH_3(101^\circ)$ down group -15 of the periodic table is due to .

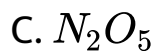
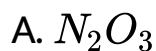
- A. increasing bp-bp repulsion
- B. increasing p-orbital character in sp^3
- C. decreasing lp-bp repulsion
- D. decreasing electronegativity

Answer: D



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18. Which of the following oxides does not form acidic aqueous solution ?



Answer: D



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19. Dinitrogen pentoxide, a colourless deliquescent solid is prepared by

A. heating NH_4NO_2 with an excess of oxygen

B. dehydrating HNO_3 with CaO

C. dehydrating HNO_3 with P_4O_{10}

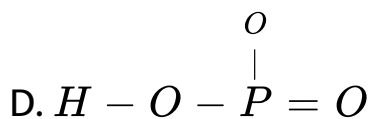
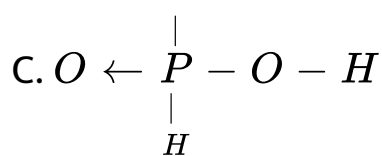
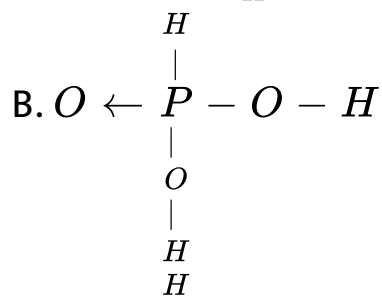
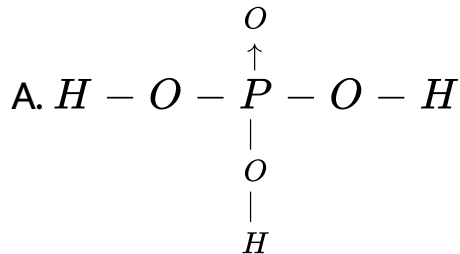
D. heating a mixture of HNO_2 and $Ca(NO_3)_2$

Answer: C



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20. The structure of orthophosphoric acid is



Answer: A



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21. How many bonding electron pairs are there in white phosphorus ?

A. 6

B. 12

C. 4

D. 8

Answer: A



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22. H_3PO_3 is

A. dibasic acid

B. tribasic acid

C. monobasic

D. Neutral

Answer: A



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23. Oxidation state of phosphorus in cyclotrimetaphosphoric acid is

A. +3

B. +5

C. -3

D. $+2$

Answer: B



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24. The basicity of pyrophosphorous acid is

A. 2

B. 4

C. 1

D. 5

Answer: A

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25. The hydrolysis of NCl_3 by water produces

A. NH_2OH and $HOCl$

B. NH_2NH_2 and HCl

C. NH_4OH and $HOCl$

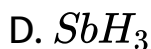
D. NH_2Cl and $HOCl$

Answer: C

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

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



Answer: D



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27. The total number of P-O bonds in P_4O_{10} is

A. 16

B. 12

C. 8

D. 4

Answer: A

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28. Nitrous oxide is

A. acidic

B. basic

C. amphoteric

D. Neutral

Answer: D



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29. Which of the following represents laughing gas?

A. nitrogen oxide

B. nitric oxide

C. nitrogen trioxide

D. nitrogen pentoxide

Answer: A



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30. The gas produced from thermal decomposition of $(NH_4)_2Cr_2O_7$ is

A. NH_3

B. N_2

C. O_2

D. NO

Answer: B



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31. Which is the most thermodynamically stable allotropic form of phosphorus ?

A. red

B. black

C. white

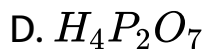
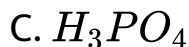
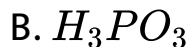
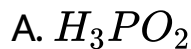
D. yellow

Answer: B



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32. P_4O_{10} is the anhydride of the following



Answer: C



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33. Atoms in P_4 molecule of white phosphorus are arranged regularly in the following way :

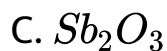
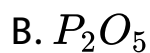
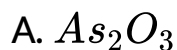
- A. at the corners of a cuba
- B. at the corners of a octahedron
- C. at the corners of a tetrahedron
- D. at the centre and corners of a tetrahedron

Answer: C



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34. Of the following compounds, the most acidic is



D. Bi_2O_3

Answer: B



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35. Which of the following oxides of nitrogen is the anhydride of nitrous acid?

A. NO

B. N_2O_3

C. N_2O_4

D. N_2O_5

Answer: B



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36. Which of the following has the highest proton affinity?

A. Arsine (AsH_3)

B. Stibine (SbH_3)

C. Ammonia (NH_3)

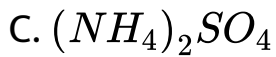
D. Phosphine (PH_3)

Answer: C



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37. Nausadar is



Answer: B



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38. When plants and animals decay , the organic nitrogen is converted into inorganic nitrogen. The inorganic nitrogen is in the form of

- A. ammonia
- B. elements of nitrogen
- C. nitrates
- D. nitrides

Answer: A



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39. Which of the following will be obtained on heating orthophosphorous acid ?

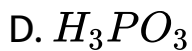
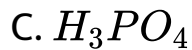
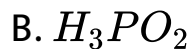
- A. Metaphosphoric acid
- B. phosphorous acid
- C. Hypophosphorous acid
- D. Phosphine

Answer: D



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40. PCl_3 on hydrolysis gives



Answer: D



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41. PH_3 , the hydride of phosphorous is

A. metallic

B. ionic

C. non-metallic

D. covalent

Answer: D



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42. White phosphorus on reaction with $NaOH$ gives PH_3 as one of the products. This is a

A. dimerisation reaction

B. disproportionation reaction

C. condensation reaction

D. precipitation reaction

Answer: B



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

A. nitrogen

B. phosphorus

C. arsenic

D. bismuth

Answer: A



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44. What are common oxidation states of group 15 elements?

A. +3 and +5

B. -3 and -5

C. -5 and +5

D. -3, +3 and +5

Answer: D



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

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

Answer: A



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46. When H_2S gas is passed through nitric acid, the product is :

- A. rhombic S
- B. prismatic S (colloidal)
- C. amorphous S
- D. monoclinic S

Answer: B



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47. Atomicity of sulphur in rhombic sulphur is

A. 1

B. 2

C. 4

D. 8

Answer: D



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

A. electronegativity of O is greater than S

B. difference in the bond angles of both the molecules

C. association take place in H_2S due to H-bonding while no H-bonding in H_2S

D. O and S belong to different periods

Answer: C

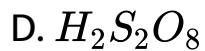
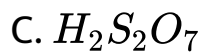


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49. Oleum is

A. H_2SO_3

B. H_2SO_5



Answer: C



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50. A gas , that relights glowing splinter , is



Answer: B



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51. Which element is not considered as 'chalcogens' ?

- A. Selenium
- B. Oxygen
- C. Sulphur
- D. Polonium

Answer: D



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52. Excess of PCl_5 reacts with concentrated H_2SO_4 giving :

A. chlorosulphonic acid

B. thionyl chloride

C. sulphuryl chloride

D. sulphurous acid

Answer: C



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53. Bleaching action of SO_2 is due to its

A. oxidising property

B. acidic property

C. basic property

D. reducing property

Answer: D

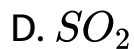


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54. Copper turnings when heated with concentrated sulphuric acid will give

A. H_2S

B. O_2

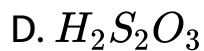
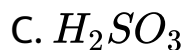
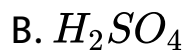
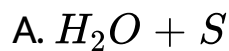


Answer: D



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55. $SO_2 + H_2S \rightarrow$ Product. The final product is

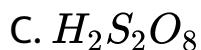
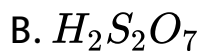
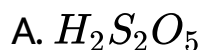


Answer: A



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56. Which oxyacid of sulphur contains S-S single bond?



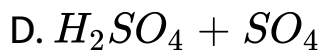
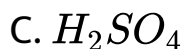
D. `Mustard gas

Answer: A



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57. Fuming sulphuric acid is



Answer: A



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58. Which is not the correct statement ?

A. The S_8 ring is not planar

B. Oxygen is more electronegative than sulphur

C. SF_4 exist but OF_4 does not exist

D. SO_3^- and SO_3^{2-} both have trigonal planar geometry

Answer: D



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59. Which one of the following compounds is a peroxide?

A. NO_2

B. KO_2

C. BaO_2

D. MnO_2

Answer: C



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60. Bromine water reacts with SO_2 to form

A. HBr and S

B. H_2O and HBr

C. S and H_2O

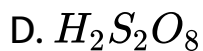
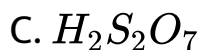
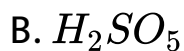
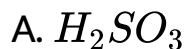
D. H_2SO_4 and HBr

Answer: D



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61. Sulphur trioxide gas when dissolve in H_2SO_4 the product obtained is



Answer: C



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

- A. critical temperature
- B. transition temperature
- C. Boyle's temperature
- D. inversion temperature

Answer: B



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63. Sulphuric acid has great affinity for water because it

- A. acid decomposes water
- B. it hydrolyses the acid
- C. it decomposes the acid
- D. acid forms hydrates with water

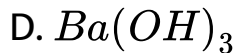
Answer: D



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64. BaO_2 and ozone reacts to produce

- A. Ba

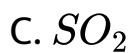


Answer: C



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65. A colourless gas with smell of rotten fish is



D. None of these

Answer: B



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66. $H_2S_2O_8$ is

A. pyrosulphuric acid

B. Marshall's acid

C. oleum

D. All of these

Answer: B



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67. The most efficient agent for the absorption of SO_3 is

A. 80 % H_2SO_4

B. 98 % H_2SO_4

C. 50 % H_2SO_4

D. 20 % H_2SO_4

Answer: B



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68. Which of the following are peroxyacids of sulphur ?

A. H_2SO_5 and $H_2S_2O_8$

B. H_2SO_5 and $H_2S_2O_7$

C. $H_2S_2O_7$ and $H_2S_2O_8$

D. $H_2S_2O_6$ and $H_2S_2O_7$

Answer: A



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69. Sulphur in +3 oxidation state is present in

A. dithionous acid

B. sulphurous acid

C. thionous acid

D. pyrosulphuric acid

Answer: A

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70. The S-S-S bond angle in S_8 molecule is

A. 109.5°

B. 105°

C. 110°

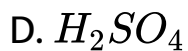
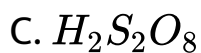
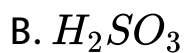
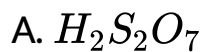
D. 60°

Answer: B



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71. Which one is known as oil of vitriol ?

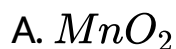


Answer: D



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72. Which of the following is used to prepare Cl_2 gas at room temperature from concentrated HCl ?



Answer: C



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73. In the manufacture of bromine from sea water the mother liquor containing bromide is treated with

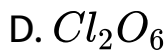
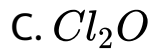
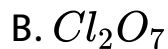
- A. carbon dioxide
- B. chlorine
- C. iodine
- D. sulphur dioxide

Answer: B



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74. Which on is the anhydride of $HClO_4$?

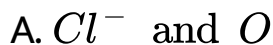


Answer: B



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75. ClO^- disproportionate into



D. Cl^- and O^-

Answer: B



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76. Which among the following factors is the most important in making fluorine the strongest oxidizing halogen ?

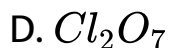
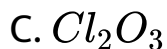
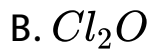
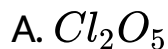
- A. Electron affinity
- B. Ionisation enthalpy
- C. Hydration enthalpy
- D. Bond dissociation energy

Answer: C



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77. Most acidic oxide among the following is



Answer: D



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78. Iodine deficiency in diet is known to cause

A. rickets

B. night blindness

C. beri-beri

D. goitre

Answer: D



Watch Video Solution

79. Among the halogens, the one which is oxidised by nitric acid is

A. fluorine

B. iodine

C. chlorine

D. bromine

Answer: B



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80. Fluorine is the best oxidising agent because it has

A. highest electron affinity

B. highest E_{red}°

C. highest E_{oxid}°

D. lowest electron affinity

Answer: B



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81. Which of the following has least bond dissociation energy ?

A. Cl-Cl

B. F-F

C. Br-Br

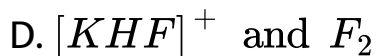
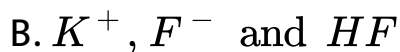
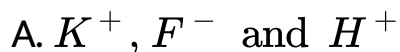
D. H-I

Answer: D



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82. KF combines with HF to form KHF_2 . The compound contains the species



Answer: C



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83. Bromine can be liberated from potassium bromide solution by the action of

A. KI

B. NaCl

C. Cl_2

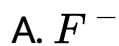
D. I_2 solution

Answer: C



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84. Which among the following is strongest reducing agent?



Answer: D



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85. The weakest acid is

A. HI

B. HBr

C. HCl

D. HF

Answer: D



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86. Which element undergoes disproportionation in water ?

A. Cl_2

B. F_2

C. K

D. Cs

Answer: A



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87. Least volatile hydrogen halide is

A. HF

B. HCl

C. HI

D. HBr

Answer: A



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88. To make a painting over glass , we use

A. fluorine

B. chlorine

C. bromine

D. hydrogen chloride

Answer: A



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89. Fluorine is not prepared by general methods because

- A. HF can be easily oxidised
- B. HF cannot be easily oxidised
- C. HF is highly poisonous
- D. HF is a good conductor of electricity

Answer: B



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90. Fluorine reacts with water to give

A. HF and O_2

B. HF and OF_2

C. HF and O_3

D. HF , O_2 and O_3

Answer: D



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91. Which of the following is the most powerful oxidising agent ?

A. I_2

B. F_2

C. Br_2

D. F_2

Answer: B



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92. The reaction of Cl_2 and X gives bleaching powder

. X is

A. CaO

B. $Ca(OH)_2$

C. $Ca(OCl)_2$

D. $Ca(ClO_3)_2$

Answer: B



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93. The reaction that takes place when Cl_2 gas is passed through conc NaOH solution is

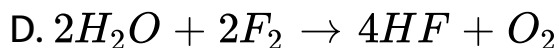
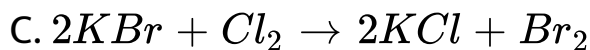
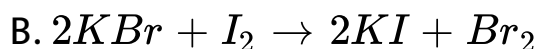
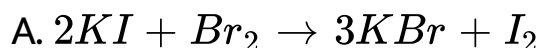
- A. oxidation
- B. reduction
- C. displacement
- D. disproportionation

Answer: D



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94. Which of the following reaction is not feasible?

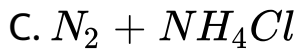
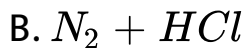


Answer: B



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95. Chlorine reacts with excess of ammonia to form.



Answer: C



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96. Which of the following is not correct ?

A. In Nelson method of NaOH preparation , Cl_2 is liberated at anode .

B. With hot and conc. NaOH , Cl_2 gas gives $NaClO_3$

C. NaOH reacts with white phosphorous to give phosphine

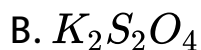
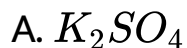
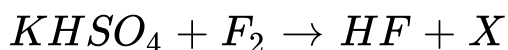
D. NaOH is used in rayon industry

Answer: B



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97. What is X in the following reaction



D. $K_2S_2O_8$

Answer: D



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98. Colour of the solution when KI reacts with Br_2 is

A. blue

B. black

C. red

D. no change

Answer: B



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99. Which is the coordinating solvent in the following reactions ? $BF_3 + HF + H_2O \rightarrow H_3O^+ + BF_4^-$

A. HF

B. H_2O

C. NH_3

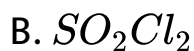
D. BF_3

Answer: A



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100. Which of the following product is formed by the reaction of sulphur dioxide with chlorine in the presence of sunlight ?



Answer: B



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101. Chlorine acts as a bleaching agent only in the presence of

A. dry air

B. moisture

C. sunlight

D. pure oxygen

Answer: B



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102. Which of the following is strongest acid ?

A. HI

B. HBr

C. HCl

D. HF

Answer: A



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103. The gas which liberates bromine from a solution of KBr is

A. I_2

B. HI

C. Cl_2

D. SO_2

Answer: C



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104. T-shaped interhalogen compounds is

A. ClF_3

B. ICl

C. ClF_5

D. IF_5

Answer: A



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

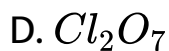
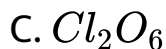
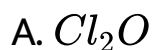


Answer: D



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106. Which oxide of the chlorine is used as a bleaching agent for paper pulp and textiles and in water treatment ?

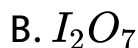
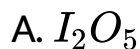


Answer: B



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107.A..... is used in the estimation of carbon monoxide . Here , A refers to



Answer: A



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108. The ionic character of the metal halides MCl ,
 MI, MBr, MF decreases in the order

A. $MF > MBr > MI > MCl$

B. $MI > MBr > MF > MCl$

C. $MF > MCl > MBr > MI$

D. $MBr > MF > MI > MCl$

Answer: C



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109. Which of the following fact is /are true about chlorine ?

A. It is a greenish yellow gas

B. It has pungent and suffocating odour

C. It is about 2-5 time heavier than air

D. All of the above

Answer: D



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110. Chlorine is used in

A. the extraction of gold and platinum

B. bleaching wood pulp

C. sterilising drinking water

D. All of the above

Answer: D



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111. Explain why fluorine forms only one oxoacid, HOF.

- A. high electronegativity
- B. small size
- C. low electronegativity and large size
- D. Both (a) and (b)

Answer: D



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112. The hybrid state of halogen atom is sp^3 in



D. All of these

Answer: D



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113. When twoA..... halogen react with each other , interhalogen compounds are formed . Here , A refers to

- A. same
- B. different
- C. Either (a) and (b)
- D. None of these

Answer: B



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114. Interhalogen compounds are

- A. covalent molecules
- B. diamagnetic in nature
- C. volatile solids/liquids at 298K except ClF

D. All of the above

Answer: D



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115. Interhalogen compounds can be used as

I. non-aqueous solvents,

II. Fluorinating agents.

The correct use(s) is/are

A. Only I

B. Only II

C. Both I and II

D. Neither I nor II

Answer: C



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116. Molecules of a noble gas do not possess vibrational energy because a noble gas

- A. is monoatomic
- B. is chemically inert
- C. has completely filled shells
- D. is diamagnetic

Answer: A



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117. The noble gas used in atomic reactors is

A. krypton

B. oxygen

C. neon

D. helium

Answer: D



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118. Which is the most easily liquifiable rare gas

A. Xe

B. Kr

C. Ar

D. Ne

Answer: A



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119. The inert gas producing maximum number of compounds are

A. He and Ne

B. Ar and Ne

C. Kr and Ne

D. Ar and Xe

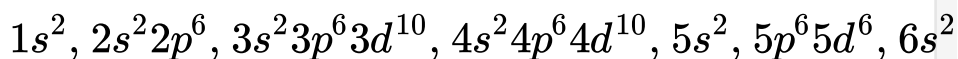
Answer: D



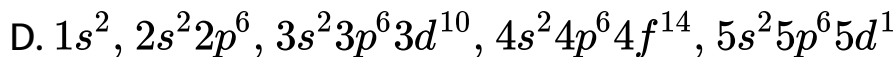
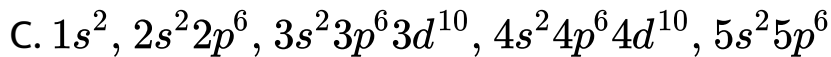
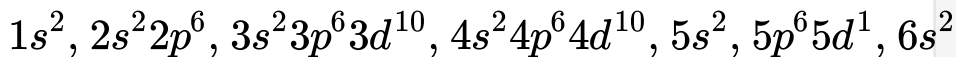
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120. Which of the following represents noble gas configuration?

A.



B.



Answer: C



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121. Which of the following noble gases is used in miner's cap lamp ?

A. Helium

B. Neon

C. Argon

D. Krypton

Answer: D



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122. The coloured discharge tubes for advertisement mainly contains

A. He

B. Ne

C. Ar

D. Kr

Answer: B



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123. Which of the following compound of xenon has pyramidal geometry ?



Answer: C



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124. Which of the following is monoatomic ?

A. Sulphur

B. Helium

C. Phosphorus

D. Chlorine

Answer: B



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125. The geometry of $XeOF_2$ is

A. pyramidal

B. T-shaped

C. octahedral

D. tetrahedral

Answer: B



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126. The noble gas which can diffuse through rubber and glass easily is

A. Xe

B. Ne

C. Ar

D. He

Answer: D



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127. The noble gas was first time discovered by

A. Cavendish

B. William Ramsay

C. Rayleigh

D. Frankland

Answer: B



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128. Argon was discovered by

A. Reyleigh

B. Ramsay

C. Both (a) and (b)

D. Frankland and Lockeyer

Answer: C



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129. What is the nature of the forces present in the noble gas atoms ?

- A. van der Waals' force
- B. ion-dipole forces
- C. London-dispersion forces
- D. magnetic forces

Answer: A



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130. Argon is used

- A. to obtain low temperature
- B. in high temperature welding
- C. in radiotherapy for the treatment of cancer
- D. in filling airships

Answer: B



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131. Which of the following is formed by xenon ?



D. XeF_5

Answer: B



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132. Noble gas which forms interstitial compounds with metals is

A. helium

B. argon

C. neon

D. xenon

Answer: A



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133. Welding of magnesium can be done in an atmosphere of

A. Xe

B. He

C. Kr

D. Ne

Answer: B



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134. Gradual addition of electronic shells in the noble gases causes a decrease in their

A. ionisation energy

B. density

C. boiling point

D. atomic radius

Answer: A



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135. Noble gases are sparingly soluble in water due to

- A. dipole -dipole interaction
- B. dipole-induced dipole interaction
- C. induced dipole-induced dipole interaction
- D. hydrogen bonding

Answer: C



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136. The correct order of solubility in water for

He, Ne, Ar, Kr, Xe, is

A. $Xe > Kr > Ar > Ne > He$

B. $Ar > Ne > He > Kr > Xe$

C. $He > Ne > Ar > Kr > Xe$

D. $Ne > Ar > Kr > He > Xe$

Answer: A



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Exercise 2

1. Which of the following is not correct ?

A. XeO_3 has four σ and four π -bonds

B. The hybridisation of Xe in XeF_4 is sp^3d^2

C. Among noble gases ,the occurrence (per cent by weight) of argon is highest in air

D. Liquid helium is used as cryogenic liquid

Answer: A

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2. In the long form of the periodic table the valence shell electronic configuration of $5s^25p^4$ corresponds to the element present in:

A. group 17 and period 6

B. group 17 and period 5

C. group 16 and period 6

D. group 16 and period 5

Answer: D



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3. Concentrated nitric acid upon long standing turns yellowish-brown due to the formation of :

A. NO

B. NO_2

C. N_2O

D. N_2O_4

Answer: B



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4. A boy accidentally splashes a few drops of *conc.* H_2SO_4 on his cotton shirt and splashed part blackens and holes appears. This is because the sulphuric acid

A. heats up the cotton

B. removes the elements of water from cotton

C. causes the cotton to react with water

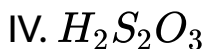
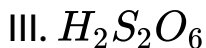
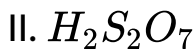
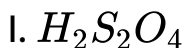
D. dehydrates the cotton with burning .

Answer: B



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5. The oxoacids of S having -S-S- bond is/are



Choose the correct option.

A. I and III

B. II and IV

C. I and II

D. II and III

Answer: A



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6. When HCl reacts with finely powdered iron, it forms ferrous chloride and not ferric chloride, why?

A. its reaction with iron produces H_2

B. liberation of hydrogen prevents the formation of ferric chloride

C. Both (a) and (b)

D. None of the above

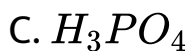
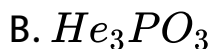
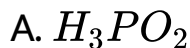
Answer: C



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7. Consider H_3PO_2 , H_3PO_3 , H_3PO_4 and $H_4P_2O_7$.

Which of the above oxoacids results into two series of salts ?



Answer: B



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8. Draw the structure of BrF_3 .

A. 

B. 

C. 

D. None of these

Answer: C



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9. Liquor ammonia bottles are opened only after cooling. This is because

- A. it is a mild explosive
- B. it generates high vapour pressure
- C. Both (a) and (b)
- D. it is a lachrymatory

Answer: C



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10. Consider the following statement .

I. $XeOF_4$ has square pyramidal structure .

II. XeF_2 has linear structure .

Which of the above mentioned statements(s) is/are true ? Choose the correct option.

A. Only I

B. Only II

C. Both I and II

D. Neither I nor II

Answer: C



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11. Ammonia forms the complex $[Cu(NH_3)_4]^{2+}$ with copper ions in alkaline solution but not in acid solution. The reasons for it is:

A. In acidic solutions hydration protects copper ions

B. In acidic solutions protons coordinate with ammonia molecules forming NH_4^+ ions has

NH_3 molecules are not available

C. In alkaline solutions insoluble $Cu(OH)_2$ is precipitated which is soluble in excess of any alkali .

D. Copper hydroxide is an amphoteric substance

Answer: B

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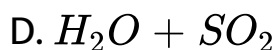
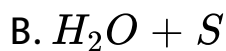
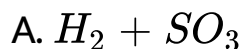
12. The ease of liquefaction of noble gases increases in the order



Answer: C

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13. H_2S reacts with O_2 to form



Answer: B



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14. On heating NH_4NO_3 strongly which is obtained ?

A. NO_2

B. NH_3

C. N_2

D. N_2O

Answer: D



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15. Sulphuric acid reacts with PCl_5 to give

A. thionyl chloride

B. sulphur monochloride

C. sulphuryl chloride

D. sulphur tetrachloride

Answer: C

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16. The type of bonds present in sulphuric anhydride

A. 3σ and three $p\pi - d\pi$

B. 3σ one $p\pi - p\pi$ and $2p\pi$ and $d\pi$

C. 2σ and three $p\pi - d\pi$

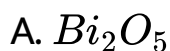
D. 3σ and two $p\pi - d\pi$

Answer: B



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



Answer: B



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18. When conc. HNO_3 is heated with P_2O_5 , it forms

A. N_2O

B. NO

C. NO_2

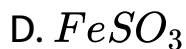
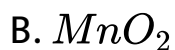
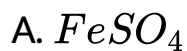
D. N_2O_5

Answer: D



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19. In the laboratory H_2S gas is prepared by using black lumps and dil. H_2SO_4 . The black lumps are



Answer: C



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20. When conc. H_2SO_4 is heated with P_2O_5 , the acid is converted to

A. sulphur trioxide

B. sulphur dioxide

C. sulphur

D. a mixture of sulphur dioxide and sulphur trioxide

Answer: A



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21. Sulphur does not exist as S_2 molecule because

- A. it is less electronegative
- B. it is not able to constitute $p\pi - p\pi$ bonds
- C. it has ability to exhibit catenation
- D. of tendency to show variable oxidation states

Answer: B



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22. SO_2 does not act as a/an

- A. bleaching agent
- B. oxidising agent
- C. reducing agent

D. dehydrating agent

Answer: D



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23. The noble gas mixture is cooled in a coconut bulb at 173K. The gases that are not adsorbed are

A. Ne and Xe

B. He and Xe

C. Ar and Kr

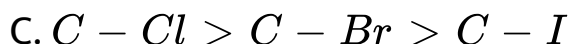
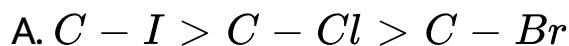
D. He and Ne

Answer: C



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24. Among the C-X bond (where, X=Cl,Br,I) the correct decreasing order of bond energy is



Answer: C



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25. Bond length is maximum in

A. HF

B. HCl

C. HI

D. HBr

Answer: C



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26. Reduction potentials of some ions are given below.

Arrange them in decreasing order of oxidising power.

Ion ClO_4^- IO_4^- BrO_4^-

Reduction

$$E^\ominus = 1.19V \qquad E^\ominus = 1.65V \qquad E^\ominus = 1.74$$

potential E^\ominus / V



Answer: D



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27. When PbO_2 reacts with conc. HNO_3 the gas evolved is

A. NO_2

B. O_2

C. N_2

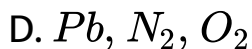
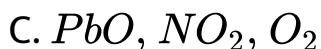
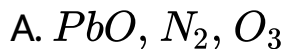
D. N_2O

Answer: B



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28. On heating $Pb(NO_3)_2$ the products formed are :

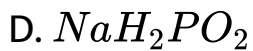
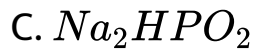
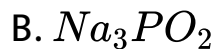
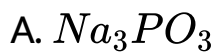


Answer: C



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29. The correct formula of salt formed by the neutralisation of hypophosphorous acid with NaOH is



Answer: D



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30. Zinc and cold dil. HNO_3 reacts to produce



D. $ZnNO_3$

Answer: C

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31. Iron is dropped in dil. HNO_3 , it gives

A. ferric nitrate

B. ferric nitrate and NO_2

C. ferrous nitrate and ammonium nitrate

D. ferrous nitrate and nitric oxide

Answer: C



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32. When tin is treated with concentrated nitric acid

- A. it is converted into stannous nitrate
- B. it is converted into stannic nitrate
- C. it is converted into metastannic acid
- D. it becomes passive

Answer: C



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

A. 1

B. 2

C. 3

D. 4

Answer: D



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34. Among the following , the correct statement is

- A. between NH_3 and PH_3 , NH_3 is a better electron donor because the lone pair of electrons occupies spherical s-orbital and is less directional
- B. between NH_3 and PH_3 , PH_3 is a better electron donor because the lone pair of electrons occupies sp^3 -orbital and is more directional
- C. between NH_3 and PH_3 , NH_3 is a better electron donor because the lone pair of electrons occupies sp^3 -orbital and is more directional

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

Answer: C



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35. The number of P-P-P bridges in the structure of phosphorus pentoxide and phosphorus trioxide are respectively

A. 5,5

B. 5,6

C. 5,6

D. 6,6

Answer: D



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36. Consider the following statements,

I. Fluorine forms two oxides OF_2 and O_2F_2 .

II. OF_2 is thermodynamically stable at 298 K.

III. O_2F_2 oxidises plutonium to PuF_6 .

The correct set of statements is,

A. I and II

B. II and III

C. I and III

D. I,II and III

Answer: D



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37. The following acids have been arranged in order of decreasing acid strength. Identify the correct order.

CLOH (I) , BrOH (II) , IOH(III)

A. $I > II > III$

B. $II > I > III$

C. $III > II > I$

D. $I > III > II$

Answer: A



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38. NH_3 gas is dried over

A. CaO

B. HNO_3

C. P_2O_5

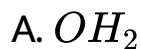
D. $CuSO_4$

Answer: A



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39. Which one of the following compounds has the smallest bond angle in its molecule ?



Answer: B



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

A. 6

B. 16

C. 20

D. 17

Answer: B



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41. On treating PCl_5 with H_2SO_4 , sulphuryl chloride (SO_2Cl_2) is formed as the final product. This shows that H_2SO_4

A. has two hydroxyl groups in its structure

B. is a derivative of sulphur dioxide

C. is a dibasic acid

D. has greater affinity for water

Answer: A



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42. Write the conditions to maximise the yield of H_2SO_4 by contact process.

- A. Low temperature and high pressure
- B. High temperature and low pressure
- C. High temperature high pressure
- D. Low temperature and low pressure

Answer: A



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

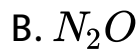
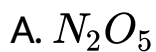
- A. can be oxidised by heating in air
- B. are both soluble in CS_2
- C. consists of same kind of atoms
- D. can be converted into one another

Answer: B



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44. Which oxide does not act as a reducing agent?



Answer: A



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

A. zero

B. three

C. two

D. four

Answer: B



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46. Consider the following compounds :

(i) sulphur dioxide

(ii) hydrogen peroxide

(iii) ozone

Among these compounds, those which can act as bleaching agents would include :

A. 1 and 3

B. 2 and 3

C. 1 and 2

D. 1,2 and 3

Answer: D



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47. Liquide ammonia is used for refrigeration because

A. it is basic

B. it is a stable compound

C. it has high dipole moment

D. it has a high heat of vapourisation

Answer: D

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48. Which one of the following pairs of reactants does not form oxygen when they react with each other ?

A. F_2 , NaOH solution (hot , conc.)

B. F_2 , H_2O

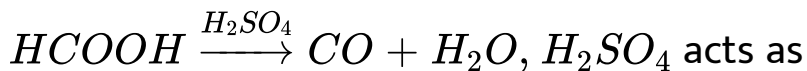
C. Cl_2 , NaOH solution (cold, dilute)

D. $CaOCl_2$, H_2SO_4 (dilute , small amount)

Answer: C

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49. In the reaction



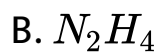
- A. reducing agent
- B. oxidising agent
- C. dehydrating agent
- D. All of the above

Answer: C



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50. Ammonia , on reaction with hypochlorite anion, can form



Answer: B



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51. 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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52. The reason why conc. H_2SO_4 is used extensively to prepare other acids is that conc. H_2SO_4 is

- A. is highly ionised
- B. is dehydrating agent
- C. has high specific gravity and density
- D. has high boiling point

Answer: D



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

A. orthophosphate

B. pyrophosphate

C. metaphosphate

D. hypophosphate

Answer: A



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54. Which of the following statements regarding ozone is not true?

A. The ozone molecule is angular in shape

B. The ozone is a resonance hybrid of two structures

C. The oxygen -oxygen bond length in ozone is identical with that of molecular oxygen

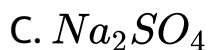
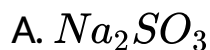
D. Ozone is used as germicide and disinfectant for the purification of air

Answer: C



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55. Which of the following salt would give SO_2 with hot and dil. H_2SO_4 and also decolourise Br_2 water?

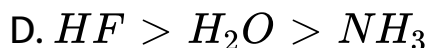


Answer: A



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56. In which cases, the order of acidic strength is not correct ?

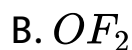
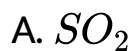


Answer: B



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57. Which of the following dissolves in water but does not give any oxyacid solution ?



Answer: B



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58. Identify the incorrect statement among the following.

A. Ozone reacts with SO_2 to gives SO_3 .

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

C. Cl_2 reacts with excess of NH_3 to give N_2 and HCl

.

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

Answer: D



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59. Concentrated hydrochloric acid when kept in open air sometimes produces a cloud of white fumes. The explanation for it is that :

A. concentrated hydrochloric acid emits strongly smelling HCl gas all the time

B. oxygen in air reacts with the emitted HCl gas to form a cloud of chlorine gas

C. strong affinity of HCl gas for moisture in air result in forming droplets of liquid solution which appears like a cloudy smoke

D. due to strong affinity for water , concentrated hydrochloric acid pulls moisture of air towards itself. This moisture forms droplets of water and hence the cloud.

Answer: B

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60. The reaction of the type $2X_2 + S \rightarrow SX_4$ is shown by sulphur when X is

A. fluorine and chlorine

B. chlorine

C. chlorine and bromine

D. F,Cl,Br

Answer: A



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Mht Cet Corner

1. Which is the most stable allotrope of sulphur ?

A. Octahedral sulphur

B. Monoclinic sulphur

C. Plastic sulphur

D. Colloidal sulphur

Answer: A



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2. The most abundant noble gas in the atmosphere is

A. neon

B. argon

C. xenon

D. Krypton

Answer: B



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3. What is the highest oxidation state exhibited by group 17 elements ?

A. +1

B. +3

C. +5

D. +7

Answer: D



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4. Which among the following group 15 element forms most stable pentavalent compound ?

A. Phosphorus

B. Antimony

C. Bismuth

D. Arsenic

Answer: A



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5. Electronic configuration of only one P block element is exceptional one molecule of that element consists of how many atoms of it ?

A. One

B. Two

C. Three

D. Four

Answer: A



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6. What is the most abundant element on earth ?

A. Hydrogen

B. Nitrogen

C. Oxygen

D. Silicon

Answer: C



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7. Identify a metalloid from the following list of elements

A. Carbon

B. Neon

C. Sodium

D. Tellurium

Answer: D



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8. What is the basicity of orthophosphorous acid ?

A. One

B. Two

C. Three

D. Four

Answer: B



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9. Which halogen forms an oxoacids that contains the halogen atom in tripositive oxidation state ?

A. fluorine

B. chlorine

C. bromine

D. Iodine

Answer: B



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10. Which oxoacid of sulphur contains S-S bond in its structure ?

- A. Disulphurous acid
- B. Disulphuric acid
- C. Perdisulphuric acid
- D. Hydrosulphurous acid

Answer: D



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11. In which of the following oxides of nitrogen, the oxidation state of the element is the lowest ?

A. Nitric oxide

B. Nitrous oxide

C. Nitrogen dioxide

D. Nitrogen trioxide

Answer: B



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12. Which of the following group 16 elements exists in more than two allotropic states ?

A. Polonium

B. Tellurium

C. Selenium

D. Oxygen

Answer: C



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13. Ozone is present as a chief constituent in which region of the atmosphere ?

A. Troposphere

B. Stratosphere

C. Mesosphere

D. Thermosphere

Answer: B



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14. Which oxyacid of sulphur contains S-S single bond?

A. Oleum

B. Marshall's acid

C. Dithionic acid

D. Thiosulphuric acid

Answer: C



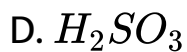
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15. Which is the strongest acid in the following ?

A. H_2SO_4

B. $HClO_3$

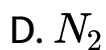
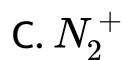
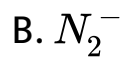
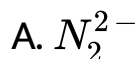
C. $HClO_4$



Answer: C

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16. Which of the following has least bond energy ? `

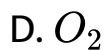
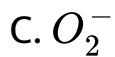
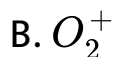
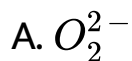


Answer: A



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17. Which of the following species has highest bond energy ?



Answer: B



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18. Which of the following Xenon fluoride does not exist ?

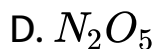
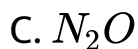
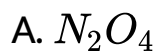


Answer: C



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19. Which of the following oxides of nitrogen is known as laughing gas?



Answer: C



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20. The geometry of I_3^- is

A. triangular

B. linear

C. tetrahedral

D. T-Shape

Answer: B



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21. The atomic number of Sn is 50. The shape of gaseous SnCl_2 molecule is

A. $\text{Cl} - \text{Sn} - \text{Cl}$

B. 

C. 

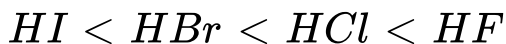
D. 

Answer: D



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22. Which of the following properties does correspond to the order?



A. Thermal stability

B. Reducing power

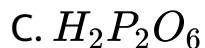
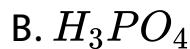
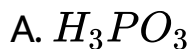
C. Ionic character

D. Dipole moment

Answer: B

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23. Which of the following phosphorus oxoacids can act as a reducing agent ?

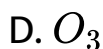
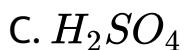


Answer: A



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24. Haber's process is used for the production of which of the following ?

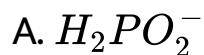


Answer: A



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25. Which one of the following species acts as both Bronsted acid and base ?



D. All of these

Answer: C



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26. Structure of ammonia is

- A. pyramidal
- B. tetrahedral
- C. trigonal
- D. trigonal pyramidal

Answer: A



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27. Pnicogens are the elements of group

- A. 15

B. 13

C. VIII

D. zero

Answer: A



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28. Which one of the following forms vortex ring

A. P_2O_5

B. PH_3

C. NH_3

D. P_4O_{10}

Answer: A



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29. How many electron pairs are present in valence shell of oxygen in water molecule ?

A. 4

B. 1

C. 2

D. 3

Answer: A



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30. C-Cl bond is stronger than C-I bond , because

- A. C-Cl bond is more ionic than C-I
- B. C-Cl bond is polar covalent bond
- C. C-Cl bond is more covalent than C-I
- D. C-Cl bond length is longer than C-I

Answer: A



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31. Number of unpaired electrons in sulphur is

A. 2

B. 6

C. 8

D. 1

Answer: A



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32. Geometry of ammonia molecule and the hybridisation of nitrogen involved in it are

A. sp^3 -hybridisation and tetrahedral geometry

B. sp^3 -hybridisation and distorted tetrahedral geometry

C. sp^2 - hybridisation and triangular geometry

D. None of the above

Answer: B



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33. Number of electrons in the valence orbit of nitrogen in an ammonia molecule are

A. 8

B. 5

C. 6

D. 7

Answer: A



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34. With cold and dilute sodium hydroxide fluorine reacts to give

A. NaF and OF_2

B. $NaF + O_3$

C. O_2 and O_3

D. $NaF + O_2$

Answer: A



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35. Which type of bond is not present in HNO_2 molecule?

- A. Ionic bond
- B. Covalent bond
- C. Coordinate bond
- D. All of three

Answer: B



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36. The shape of IF_7 molecule is

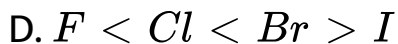
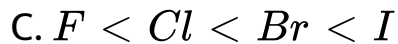
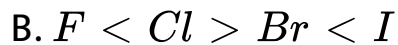
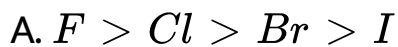
- A. pentagonal bipyramidal
- B. trigonal bipyramidal
- C. tetrahedral
- D. octahedral

Answer: A



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37. The correct order of reactivity of halogens is



Answer: A



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38. Which of the following is more soluble in ammonia
?



C. AgI

D. None of these

Answer: A



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39. The inert gas abundantly found in atmosphere is:

A. Ne

B. Kr

C. He

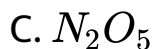
D. Ar

Answer: D



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40. When lead nitrate is heated , it gives



Answer: A



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41. Oxidation state of oxygen in F_2O is

A. +1

B. -1

C. +2

D. -2

Answer: C



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42. Which of the following hydrogen halide has the highest boiling point?

A. HF

B. HBr

C. HCl

D. HI

Answer: A



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43. Which of the following halogen does not exhibit positive oxidation state in its compounds?

A. Cl

B. Br

C. I

D. F

Answer: D



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