



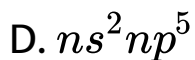
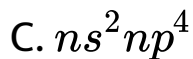
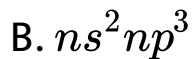
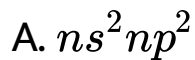
## CHEMISTRY

### BOOKS - S DINESH & CO CHEMISTRY (HINGLISH)

### THE OXYGEN FAMILY

MCQ

1. Which is the electronic configuration of the outermost shell of group 16 elements ?

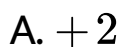


**Answer: C**



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2. The most common oxidation state for selenium in its compound is



B.  $-2$

C.  $+4$

D.  $+6$

**Answer: A**



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**3. Which of the following elements does not show an oxidation state higher than  $+2$  ?**

A. Oxygen

B. Sulphur

C. Selenium

D. Tellurium.

**Answer: A**



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**4. What is false about oxygen and sulphur ?**

A. Both can form covalent bond with metals

B. Both exist in diatomic state

C. Both can exhibit O.N. of  $-2$  as well as  $+2$

D. Both can form covalent hydrides.

**Answer: B**



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5. Water is a liquid due to the presence of

- A. covalent bonding involving H atom
- B. odd electron bond involving H atom
- C. ionic bonding involving H atom
- D. Hydrogen Bonding involving H atom

**Answer: D**



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6. If X is a member of chalcogen family, the chemical highest stability of  $X^{2-}$  is exhibited by

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

**Answer: A**



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7. The binary compounds of oxygen and fluorine are called fluorides rather than oxides because

- A. They always contain  $F^-$  ions
- B.  $O$  atom is larger than  $F$  atom
- C.  $F$  is more electronegative than  $O$
- D.  $O$  is better oxidising agent

**Answer: C**



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8. Which element of chalcogens has maximum tendency to show catenation ?

A. Oxygen

B. Selenium

C. Sulphur

D. Tellurium.

**Answer: C**



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9. The elements oxygen and sulphur are called chalcogens because

- A. their properties resemble with charcoal
- B. their properties resemble not only with charcoal but also with halogens
- C. these are ore forming elements
- D. these combine with halogens.

**Answer: C**



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10. Which of the following oxidation states cannot be exhibited by oxygen in its compounds ?

A.  $-2$

B.  $+2$

C.  $-1$

D.  $+4$

**Answer: D**



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11. Oxygen does not form  $OF_6$  because

- A. it has a small size
- B. there are no vacant d-orbitals available
- C. it has high ionization energy
- D. it has large size.

**Answer: B**



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12. The highest ionization energy among the following group 16 elements is possessed by

A. Oxygen

B. Sulphur

C. Selenium

D. Tellurium.

**Answer: A**



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**13.** Which among the elements of group 16 is radioactive ?

A. Oxygen

B. Polonium

C. Selenium

D. Tellurium.

**Answer: B**



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**14.** The molecular formula of sulphur is

A.  $S_2$

B.  $S_4$

C.  $S_6$

D.  $S_8$

**Answer: D**



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**15.** Oxygen and sulphur show similarities in many respects because of

- A. Similar electronic configuration
- B. Similar valency
- C. Both (A) and (B)
- D. Similarity in sizes.

**Answer: C**



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**16.** Which of the following does not provide reason for the anomalous behaviour of oxygen from other members of its family

- A. atomic size of oxygen is smallest amongst chalcogens
- B. oxygen shows maximum valency of two
- C. oxygen has no vacant d-orbital
- D. oxygen exhibits allotropy

**Answer: D**



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**17. Oxygen molecule exhibits**

- A. Paramagnetism
- B. Diamagnetism
- C. Ferromagnetism
- D. Ferrimagnetism.

**Answer: A**



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18. Which among the following pairs does not contain allotropes ?

A. Oxygen and ozone

B. Hydrogen and deuterium

C. Red phosphorus and yellow phosphorus

D. Diamond and graphite.

**Answer: B**



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19. The first ionization energies of group 16 elements

- A. Fall sharply from oxygen to sulphur and then fall regularly from sulphur to tellurium
- B. Fall regularly from oxygen to tellurium
- C. Rise regularly from oxygen to tellurium
- D. Rise slightly from oxygen to sulphur and then fall regularly from sulphur to tellurium

**Answer: A**



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20. Ordinary oxygen contains.

A. only  $O^7$  isotopes

B. only  $O^{16}$  isotopes

C. a mixture of  $O^{16}$ ,  $O^{17}$  and  $O^{18}$  isotopes

D. a mixture of  $O^{16}$  and  $O^{18}$  isotopes.

**Answer: C**



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21. Which of the following trioxides can exist as monomeric molecule ?

A.  $SO_3$  in solid state

B.  $SeO_3$  in all states

C.  $TeO_3$

D.  $SO_3$  in gaseous states.

**Answer: D**



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22. The second most highly electronegative elements in the periodic table is

A. Sulphur

B. Oxygen

C. Selenium

D. Polonium.

**Answer: B**



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23. The oxidation state of oxygen in  $O_2F_2$  is

A. +1

B. +2

C. +4

D. -2

**Answer: A**



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**24.** Oxygen is always divalent while sulphur can form 2, 4 and 6 bonds because

- A. Oxygen is more electronegative than sulphur
- B. Sulphur has d-orbitals while oxygen does not
- C. Sulphur has larger atomic radius than oxygen
- D. Sulphur is more electronegative than oxygen.

**Answer: B**



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25. Oxygen was discovered by\_\_\_\_\_.

A. Priestley

B. Boyle

C. Scheele

D. Cavendish

**Answer: A**



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26. Although the details of the structure of monoclinic sulphur are not well known it probably



consists of

A.  $S_8$  chains

B.  $S_2$  molecule

C.  $S_8$  rings

D.  $S_4$  rings.

**Answer: C**



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27. Percentage of  $O_2$  by volume in the atmosphere is

A. 18

B. 19

C. 24.15

D. 20.9

**Answer: D**



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**28.** Electrical conductivity of Se is negligible in dark but increases on exposure to light. Due to this property it is used in

- A. Photoelectric cells
- B. Semiconductors
- C. High voltage Batteries
- D. Lasers

**Answer: A**



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**29.** Oxygen is prepared by the fractional distillation of

- A. Water

B. Liquid air

C. Hydrogen peroxide

D. Heavy water.

**Answer: B**



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**30.** Ozone is formed by the interaction of water and

A. Potassium chloride

B. Chlorine

C. Potassium fluoride

D. Fluorine.

**Answer: D**



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**31. Which of the following represents Caro's acid ?**

A. Peroxymono sulphuric acid

B. Thiosulphuric acid

C. Dithionic acid

D. Peroxydisulphuric acid.

**Answer: A**



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**32.** In the laboratory  $SO_2$  is collected

- A. by downward displacement of air
- B. by upward displacement of air
- C. over water
- D. by downward displacement of water.

**Answer: B**



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33. Colloidal sulphur is obtained when

- A. sulphur is treated with  $H_2SO_4$
- B. sulphur is strongly heated
- C. sulphur is heated with  $HNO_3$
- D.  $H_2S$  gas is passed through dil.  $HNO_3$ .

**Answer: C**



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**34.** Which of the following process is used for extraction of sulphur from sulphur beds?

A. Acheson process

B. Carter process

C. Frasch process

D. Le-Blanc process.

**Answer: D**



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35. A chalcogen combines directly with hydrogen with great difficulty to form a hydride. This chalcogen also burns in air to form a solid polymeric dioxide and has got the highest electrical resistance amongst metals. The chalcogen is

A. O

B. S

C. Te

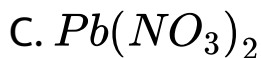
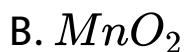
D. Se

**Answer: C**



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36. All of the following decompose easily on heating to give  $O_2$  except



**Answer: B**



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**37.** The reaction in the Kipp's apparatus stops when the outlet is closed from the top because

- A. the acid becomes weak
- B. gas starts coming out
- C. gas pressure breaks the contact between FeS and the acid
- D. protective film is formed on FeS

**Answer: C**



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38. Oxygen gas can be prepared from solid  $KMnO_4$  by

A. dissolving the solid in dil.  $H_2SO_4$

B. dissolving the solid in dil. HCl

C. treating the solid with  $H_2$  gas

D. strongly heating the solid.

**Answer: D**



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**39.** Oxygen can be obtained from bleaching powder by

- A. action of dilute acids
- B. heating it with lime
- C. heating it with a cobalt salt
- D. action of alkalis.

**Answer: C**



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**40.** The percentage of ozone in ozonised oxygen is about

A. 10

B. 40

C. 80

D. 100

**Answer: A**



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41. The hybrid state of sulphur in  $SO_3$  molecule is

A.  $sp^3d$

B.  $sp^3$

C.  $sp^3d^2$

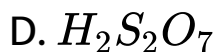
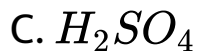
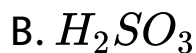
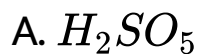
D.  $sp^2$

**Answer: D**



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42. Peroxy linkage is present in

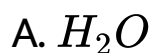


**Answer: A**



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**43.** The maximum bond angle in hydrides of group 16 elements is in





B.  $H_2S$

C.  $H_2Te$

D.  $H_2Se$

**Answer: A**



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**44.**  $H_2S$  is more acidic than  $H_2O$ . The reason is

A. oxygen is more electronegative than sulphur

B. atomic number of sulphur is higher than  
oxygen

C. H-S bond is weaker as compared to H-O bond

D. H-O bond is weaker as compared to H-S bond

**Answer: C**



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**45.** In  $SCl_2$  the central atom involves

A.  $sp^3$  hybridization

B.  $sp^3d$  hybridization

C.  $sp^3d^2$  hybridization

D.  $dsp^2$  hybridization

**Answer: A**



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**46.** In case of the hydrides  $H_2O$ ,  $H_2S$ ,  $H_2Se$  and  $H_2Te$  the acid strength of aqueous solution of equimolar concentration.

A. increases with increasing thermal stability of the hydride

B. increases with decreasing thermal stability of the hydride

C. is no related to the thermal stability of the  
hydride

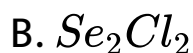
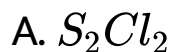
D. increases with increasing volatility of the  
hydride

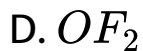
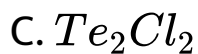
**Answer: B**



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**47. Which of the following does not exist ?**





**Answer: C**



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**48.** The shape of  $SO_2$  molecule is

A. Tetrahedral

B. Linear

C. Planar triangular

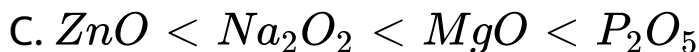
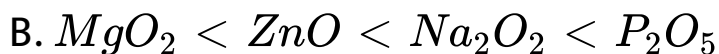
D. Bent.

**Answer: D**



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**49.** Order of increasing acidic property of  $ZnO$ ,  $Na_2O_2$ ,  $P_2O_5$ ,  $MgO$  is



**Answer: A**



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50. Which of the following statements are incorrect about the oxidation state and acidic nature of oxo-acids?

A.  $SO_3$  is a stronger oxidising agent and more acidic than  $SO_2$

B. Selenium form only two oxo-acids i.e. selenous acid ( $H_2SeO_3$ ) and selenic acid ( $H_2SeO_4$ )

C. The acidic strength and oxidising power of oxo-acids is greater in +6 oxidation state than in +4 oxidation state

D. None of these

**Answer: D**

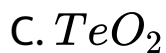


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51. Which oxide is moderately basic among the following ?

A.  $SO_2$



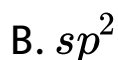
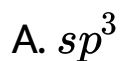


**Answer: D**



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**52.** In  $H_2S$ , sulphur atom is present in which hybrid state ?



C. sp

D.  $dsp^2$

**Answer: A**



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**53.** The oxidation state of O in  $Na_2O_2$  is

A. +2

B. -2

C. -1

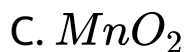
D. +1

**Answer: C**



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**54.** Which of the following is not a true peroxide?

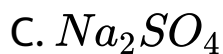
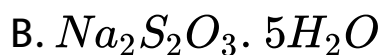
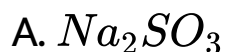


**Answer: D**



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55. Which out of the following compounds is photographers fixer?



**Answer: B**



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56. Hypo is used in photography because of its

- A. oxidizing behaviour
- B. reducing behaviour
- C. complex forming behaviour
- D. reaction with light.

**Answer: C**



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57.  $SF_6$  exists but  $OF_6$  does not because

- A. d-orbitals of sulphur are vacant and are available for bonding
- B. more bonding electrons can be accommodated in orbitals with  $n = 3$
- C. sulphur has larger ionization energy than oxygen
- D. the difference of electronegativity is less between oxygen and fluorine.

**Answer: A**



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58. In which of the following oxyacids, the oxidation number of sulphur is +6

- A. Sulphuric acid
- B. Sulphurous acid
- C. Pyrosulphuric acid
- D. Dithionic acid.

**Answer: A**



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59. The two oxygen-oxygen bond lengths in ozone are

A. 110 pm , 148 pm

B. 110 pm , 128 pm

C. 128 pm , 128 pm

D. 128 pm , 148 pm.

**Answer: C**



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60. When ozone reacts with phosphorus the oxidation state of P changes from

A. +3 to +5

B. +5 to +3

C. 0 to +3

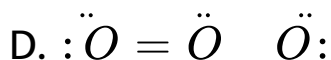
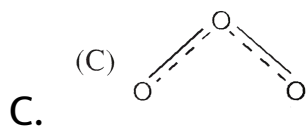
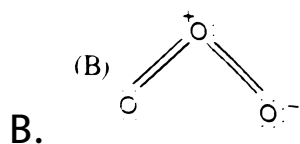
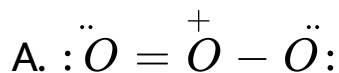
D. 0 to +5.

**Answer: D**



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61. The structure of ozone can best be represented by



Answer: C



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62. Oxygen exhibits positive oxidation state in

A. CO

B.  $F_2O$

C. NO

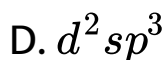
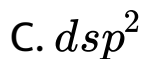
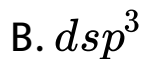
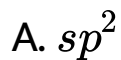
D.  $N_2O$

**Answer: B**



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63. In  $SF_4$  the type of hybridization shown by S is

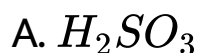


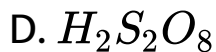
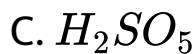
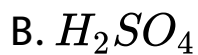
**Answer: B**



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**64.** Which out of the following oxo acids of sulphur is monobasic ?





**Answer: C**

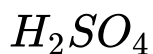


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**65.  $H_2S_2O_8$  is**

A. Marshall acid

B. an intermediate in the manufacture of



C. a peroxy compound

D. Both (A) and (C).

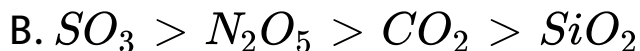
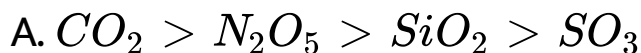
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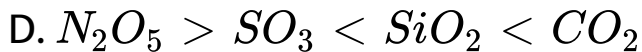
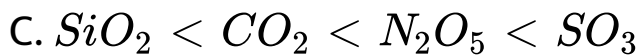


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**66.** Arrange the following as indicated.

$CO_2$ ,  $N_2O_5$ ,  $SiO_2$  and  $SO_3$  in the order of increasing acidic character.



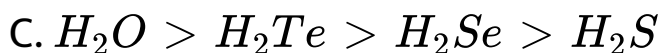
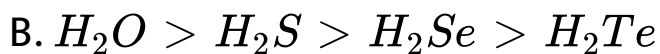
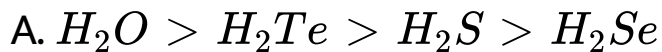


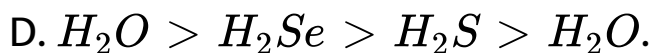
**Answer: C**



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**67.** The boiling points of hydrides of group 16 are in the order





**Answer: C**



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**68.** A yellow metallic powder is burnt in a stream of fluorine to obtain a colourless gas X which is thermally stable and chemically inert. Its molecule has octahedral geometry. Another colourless gas Y with same constituent atoms as that of X is obtained when sulphur dichloride is heated with sodium fluoride. Its molecule has trigonal



pyramidal structure. X and Y are respectively of fluorine to obtain a colourless gas X which is thermally stable and chemically inert. Its molecule has octahedral geometry. Another colourless gas Y with same constituent atoms as that of X is obtained when sulphur dichloride is heated with sodium fluoride. Its molecule has trigonal pyramidal structure. X and Y are respectively



**Answer: B**



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**69.** Ozone turns Benzidine paper

- A. Violet colour
- B. Pale yellow colour
- C. Brown colour
- D. Brownish blue

**Answer: C**



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70. When an article is bleached by  $SO_2$  it loses its colour. The colour can be restored by :

A. drying

B. heating

C. exposure to air

D. cannot be restored by any of these methods

**Answer: C**



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71. A diamagnetic metal burns in air to form a dioxide. This dioxide can reduce iodine to hydrogen iodide. When hydrogen gas is bubbled through this metal, it forms a hydride. It was found that the reaction of the dioxide and hydride of this metal produces the same metal again. The metal is

A. S

B. Si

C. Te

D. Po.

**Answer: A**



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72. Which oxide of sulphur is capable of acting as oxidising as well as reducing agent?

A.  $SO_3$

B.  $SO_2$

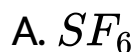
C.  $S_2O_3$

D. SO.

**Answer: B**

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73. Which of the following undergoes hydrolysis easily?



D. None.

**Answer: B**



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74. An experiment involving absorption of oxygen and its quantitative estimation would involve the use of

A. caustic soda

B. conc.  $H_2SO_4$

C. pyrogallol

D. anhydrous  $CaCl_2$

**Answer: C**



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75. In reaction of  $H_2O_2$  and alkaline

$K_3[Fe(CN)_6]$ ,  $H_2O_2$  acts as

A. Acid

B. Base

C. Oxidant

D. Reductant

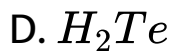
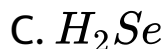
**Answer: D**



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76. Which among the following hydrides is maximum stable towards heat?

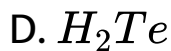
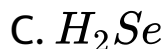


**Answer: A**



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77. Which of the following compounds is the strongest reducing agent ?

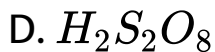
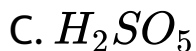
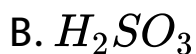
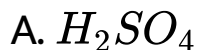


**Answer: D**



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78. Which of the following does not exist freely in nature but is a strong reducing agent ?



**Answer: B**



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**79.** Which element burns to form a gaseous oxide at room temperature ?

A. Hydrogen

B. Phosphorus

C. Calcium

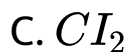
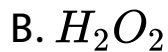
D. Sulphur

**Answer: D**



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80. Dry bleach is done by

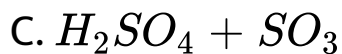
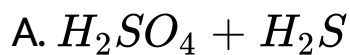


**Answer: A**



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81. Fuming sulphuric acid is



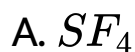
D. None.

**Answer: C**



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82. Which of the following is solid at room temperature ?



B.  $SeF_4$

C.  $TeF_4$

D.  $H_2S$

**Answer: C**



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**83.** Dilute solutions of  $H_2O_2$  cannot be concentrated by

A. vacuum distillation

B. treatment with  $P_2O_5$

C. fractional crystallization at lower temperatures

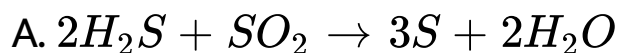
D. careful and slow evaporation in a shallow dish.

**Answer: B**



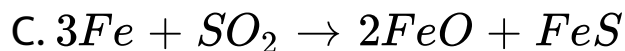
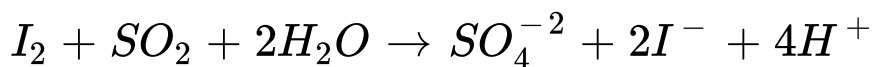
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**84.** Reducing property of  $SO_2$  is shown in the reaction





B.



D. None of these.

**Answer: B**



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85. The products obtained by passing chlorine through hypo solution are

A. S, HCl,  $Na_2S$

B. S, HCl,  $Na_2SO_3$

C. S, HCl,  $Na_2SO_4$

D. S, NaCl,  $H_2SO_4$

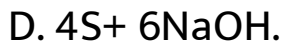
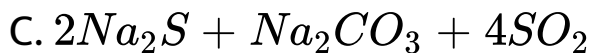
**Answer: C**



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**86.** The Spring's reaction for the preparation of sodium thiosulphate involve the following reactants as

A.  $Na_2O_3 + S$



**Answer: B**



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**87.** Which is the catalyst used in the manufacture of sulphuric acid by lead chamber process ?

A. Fe

B. Ni

C.  $V_2O_5$

D. oxides of nitrogen.

**Answer: D**



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**88.** One gas bleaches the colour of flowers by reduction and other by oxidation. These gases are

A. CO and  $Cl_2$

B.  $H_2S$  and  $Br_2$

C.  $NH_3$  and  $SO_3$

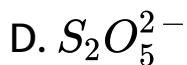
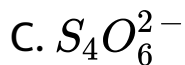
D.  $SO_2$  and  $Cl_2$

**Answer: D**



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89. Oxidation of thisulphate ( $S_2O_3^{2-}$ ) ion by iodine gives



**Answer: C**



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**90.**  $H_2SO_4$  has very high corrosive action on skin because

- A. It acts as dehydrating agent
- B. It reacts with proteins
- C. It acts as an oxidising agent
- D. It acts as dehydrating agent and absorption of water is highly exothermic.

**Answer: D**



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**91.** Yellow ammonium sulphide is



**Answer: B**



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92. On heating ozone, its volume.

- A. decreases to half
- B. becomes double
- C. increases to  $3/2$  times
- D. remains unchanged.

**Answer: C**



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93. Which of the following is a liquid ?

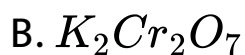


**Answer: A**



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94. The reagent used to estimate  $I_2$  volumetrically is



C. hypo

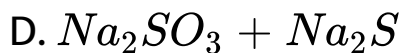
D. None

**Answer: C**



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95. When hypo is heated to high temperatures, the products are

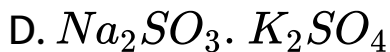
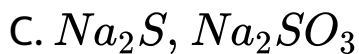
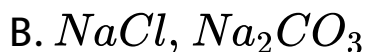
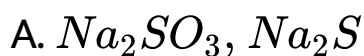


**Answer: B**



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96. Compounds ( $A$ ) and  $B$  are treated with dilute  $HCl$  separately. The gases liberated are  $Y$  and  $Z$  respectively.  $Y$  turns acidified  $K_2Cr_2O_7$  paper green while  $Z$  turns lead acetate paper black. The compounds  $A$  and  $B$  are respectively :

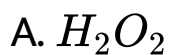


**Answer: A**



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97. All the three atoms of ozone are used up when it reacts with



**Answer: D**



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98. Which one of the following chars when warmed with concentrated  $H_2SO_4$  ?

A. Carbohydrates

B. Proteins

C. Fats

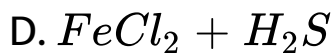
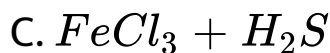
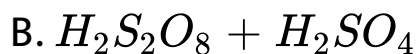
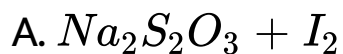
D. Hydrocarbon.

**Answer: A**



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99. Colloidal sulphur is obtained by the action of  $HNO_3$  on



**Answer: C**



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100.  $H_2S$  gas cannot be dried over conc.  $H_2SO_4$

because

- A. the acid oxidises it
- B. the acid combines with  $H_2S$  to form a salt
- C. both forms a complex
- D.  $H_2SO_4$  is not a drying agent.

**Answer: A**



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**101.** A certain compound when burned gives three oxides. The first turned lime water milky, the second turned anhydrous  $CuSO_4$  blue and the third formed an aqueous solution of low pH. The elements present in the compound are

- A. C, O and S
- B. C, H and Ca
- C. C, H and Na
- D. C, H and S

**Answer: D**



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**102.** Conc.  $H_2SO_4$  liberates hydrogen chloride gas from chlorides because

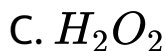
- A. It is stronger acid
- B. Sulphates are less soluble than chlorides
- C. Sulphates are more soluble than chlorides
- D. HCl is a gas while  $H_2SO_4$  is a liquid.

**Answer: D**



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**103.** An inorganic substance on heating liberates oxygen and turns an acidified solution of KI brown and also reduces acidified  $KMnO_4$ . The substance is



**Answer: C**



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104. Poison for platinum, a catalyst in contact process of  $H_2SO_4$  is \_\_\_.

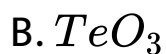
- A. Sulphur
- B. Arsenic
- C. Selenium
- D. Vanadium

**Answer: B**



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105. Which of the following exists as a cyclic tetramer in the solid state?



D. None of the above

**Answer: C**



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**106.** 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. dehydrates the cotton with burning
- B. causes the cotton to react with air
- C. heat up the cotton
- D. removes the elements of water from cotton

**Answer: D**



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107.  $H_2SO_4$  is added while preparing a standard solution of Mohr's salt to prevent \_\_\_.

A. Hydrolysis

B. Hydration

C. Reduction

D. Oxidation.

**Answer: A**



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108. 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 a high specific gravity and density
- D. has a high boiling point.

**Answer: D**



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**109.** Which form of sulphur exists in the form of zig-zag chains ?

A. Rhombic

B. Plastic

C. Monoclinic

D. None

**Answer: B**



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**110.** Underground sulphur is extracted (recovered) by the

- A. Frasch process
- B. Contact process
- C. Spring's process
- D. Bosch process.

**Answer: A**



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**111.** In the Frasch process, molten sulphur rises up from the

- A. Inner pipe
- B. Outer pipe
- C. Middle pipe
- D. All of these

**Answer: C**



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**112.** One of the following metals with which sulphur combines, is

A. Magnesium

B. Gold

C. Platinum

D. Iodine

**Answer: A**



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113. The reaction of NaCl and  $K_2Cr_2O_7$  with conc.  $H_2SO_4$  results in the formation of



**Answer: A**



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

A.  $SO_2$

B.  $SO_3$

C.  $NO_2$

D. NO

**Answer: C**



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115. Which catalyst is used now a days in the contact process for the manufacturing of sulphuric acid

A. Ni

B.  $V_2O_5$

C. Pt

D. Fe

**Answer: B**



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116.  $SO_3$  when absorbed in 98%  $H_2SO_4$  it forms

A. More concentrated  $H_2SO_4$

B.  $H_2SO_3$

C.  $H_2S_2O_8$

D.  $H_2S_2O_7$

Answer: D



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117. The property not common between  $SO_2$  and  $CO_2$  is



- A. both turn lime water milky and in excess the solution becomes clear.
- B. both are colourless.
- C. both are odourless.
- D. both support the combustion of a burning magnesium ribbon

**Answer: C**



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**118.**  $SO_3$  is not directly absorbed in water because

- A. It is insoluble in water
- B. It is insoluble in water but soluble in  $H_2SO_4$
- C. It is reduced back to  $SO_2$
- D. It forms stable mist with water.

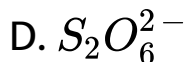
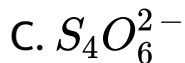
**Answer: D**



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**119.** When thiosulphate ion is oxidised by iodine.  
which one of the following ion is produced ?





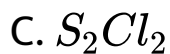
**Answer: C**



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**120.** What is formed when  $Cl_2$  is bubbled through molten sulphur ?



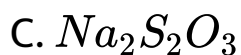


**Answer: C**



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**121.** What is not produced when sulphur reacts with boiling NaOH ?



D.  $H_2O$

**Answer: B**



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**122.** About  $H_2SO_4$  which is incorrect

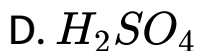
- A. Reducing agent
- B. Dehydrating agent
- C. Sulphonating agent
- D. Highly viscous.

**Answer: A**



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**123.** Which of the following gases turns lead acetate paper black?

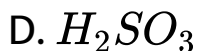
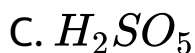
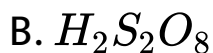
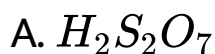


**Answer: C**



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124. Which of the following is peroxydisulphuric acid?

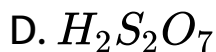
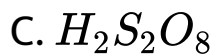
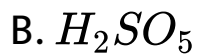
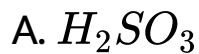


**Answer: B**



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125. Caro's acid is



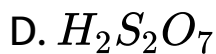
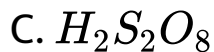
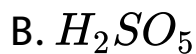
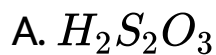
**Answer: B**



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126. Which one is known as Marshall's acid ?



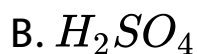
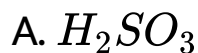


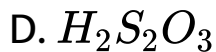
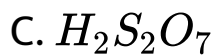
**Answer: C**



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**127.** Which one is known as oil of vitriol ?





**Answer: B**



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**128.** Bleaching action of  $SO_2$  is due to

A. Reduction

B. Oxidation

C. Hydrolysis

D. Its acidic nature

**Answer: A**



**Watch Video Solution**

**129.** Which element burns to form a gaseous oxide at room temperature ?

A. Hydrogen

B. Helium

C. Sodium

D. Sulphur

**Answer: D**



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130. The reason why conc.  $H_2SO_4$  is used extensively to prepare other acids is that conc.  $H_2SO_4$  is

- A. Highly ionised
- B. An excellent dehydrating agent
- C. Has high specific gravity
- D. Has a high boiling point

**Answer: A**



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131. Mark the compound which gives carbon with conc.  $H_2SO_4$

- A. Formic acid
- B. Ethyl alcohol
- C. Oxalic acid
- D. Starch

**Answer: D**



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**132.** Sulphuric acid has great affinity for water because it

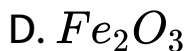
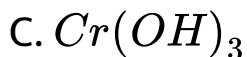
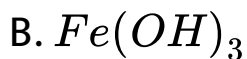
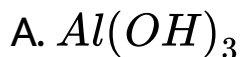
- A. It hydrolyses the acid
- B. It decomposes the acid
- C. Acid forms hydrates with water
- D. Acid decomposes water.

**Answer: C**



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133. In contact process impurities of arsenic is removed by

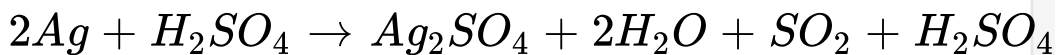


**Answer: B**



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134. In the reaction



acts as :

- A. Reducing agent as well as acid
- B. Oxidising agent as well as acid
- C. Catalytic agent
- D. Dehydrating agent as well as acid

**Answer: B**



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135. When moist coloured flowers are added into a gas of  $SO_2$  the flowers are decolourised because

- A.  $SO_2$  absorbs colouring matter
- B.  $SO_2$  oxidises vegetable colouring matter
- C.  $SO_2$  reduces vegetable colouring matter
- D.  $SO_2$  gives colourless product.

**Answer: C**



**Watch Video Solution**

136. When  $SO_2$  is passed through acidified  $K_2Cr_2O_7$  solution

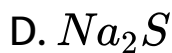
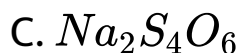
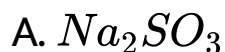
- A. The solution is turned blue
- B. The solution is decolourised
- C.  $SO_2$  is reduced
- D. Green  $Cr_2(SO_4)_3$  is formed

**Answer: D**



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137. When chlorine is bubbled through sodium thiosulphate solution what is formed ?



**Answer: B**



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138. In laboratory  $SO_2$  is prepared easily by

A. The action of moderately concentrated

$H_2SO_4$  on sulphite

B. The action of  $H_2SO_4$  on sodium sulphide

C. The action of  $H_2SO_4$  on sodium sulphate

D. None of these

**Answer: A**



**View Text Solution**

139. When  $H_2S$  reacts with halogens, halogens are

- A. Oxidised
- B. Reduced
- C. Form sulphur halides
- D. None of these

**Answer: B**



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140. Which one of the following statements are true about  $H_2S$ ?

- A. It is a dibasic acid
- B. It is monobasic
- C. It decomposes carbonates
- D. It gives only normal salts.

**Answer: A**



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



**Answer: C**



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142. When a lead storage battery is discharged:

- A.  $SO_2$  is dissolved
- B. Lead sulphate is consumed
- C. Lead is formed
- D. Sulphuric acid is consumed.

**Answer: D**



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143. When conc.  $H_2SO_4$  comes in contact with sugar it becomes black due to

- A. Hydrolysis
- B. Hydration
- C. Decolourisation
- D. Dehydration

**Answer: D**



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**144.** High density and low volatility of  $H_2SO_4$  is due to

- A. Strong interparticle covalent bonds
- B. van der Waals forces
- C. Hydrogen bonding
- D. dibasic nature

**Answer: C**



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145. Which oxide of nitrogen is used as a catalyst in lead chamber process for the manufacture of  $H_2SO_4$ ?

A. NO

B.  $NO_2$

C.  $N_2O_3$

D.  $N_2O_5$

**Answer: B**



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146. Sulphurous acid can be used as

- A. An oxidising agent
- B. A reducing agent
- C. A bleaching agent
- D. All the three

**Answer: D**



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147. Which of the following is oxidised by  $SO_2$  ?

- A. Mg

B.  $K_2Cr_2O_7$

C.  $KMnO_4$

D. All

**Answer: A**



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**148.** When  $SO_2$  is passed through acidified solution of  $H_2S$

A.  $H_2SO_4$  is formed

B.  $H_2SO_3$  is precipitated

C. Sulphur is precipitated

D.  $H_2S$  is reduced.

**Answer: C**



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**149.** When  $SO_2$  is passed through cupric chloride solution

A. A white precipitate is obtained

B. The solution becomes colourless

C. The solution becomes colourless and a white precipitate of  $Cu_2Cl_2$  is obtained

D. No visible change takes place

**Answer: C**



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**150.** A and B are two salts. A reacts both with dil  $H_2SO_4$  and conc.  $H_2SO_4$  to give reddish brown vapours. However, B reacts only with conc.  $H_2SO_4$  to give similar vapours. Hence A and B are respectively

A. NaBr,  $NaNO_3$

B.  $NaNO_3$ , NaBr

C.  $NaNO_2$ , NaBr

D. NaBr,  $NaNO_2$

**Answer: C**



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**151.** Which of the following produces a mixture of CO and  $CO_2$  by reaction with  $H_2SO_4$  ?

A. Sodium acetate



B. Sodium oxalate

C. Formic acid

D. Sucrose

**Answer: B**

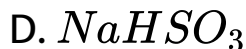
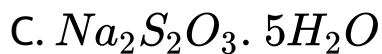


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**152.** Which one is used as a reagent in iodine titrations ?

A.  $NaSO_3$

B.  $H_2SO_3$



**Answer: C**



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**153.** Which of the following non-metals does not combine with sulphur ?

A. Fluorine

B. Hydrogen

C. Phosphorus

D. Iodine.

**Answer: D**



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**154.** Which of the non metals reacts with sulphur ?

A. Noble gases

B. Chlorine

C. Iodine

D. Nitrogen.

**Answer: B**



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**155.** Which of the following gases cannot be dried by conc.  $H_2SO_4$ ?

A. NO

B.  $PH_3$

C.  $CO_2$

D.  $H_2$

**Answer: B**



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156. Contact process is better than chamber process for the manufacture of  $H_2SO_4$  because

- A. in contact process pure acid is obtained
- B. in contact process control of plant is easier
- C. contact plant is cheaper
- D. no waste gases are given out.

**Answer: A**



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157.  $H_2SO_4$  can be stored in vessels of

A. zinc

B. iron

C. wood

D. glass.

**Answer: D**



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**158.** Sulphur disappears when it is boiled in a solution of sodium sulphite. This is due to formation of

A.  $SO_2$

B. Sodium sulphate

C.  $SO_3$

D. Sodium thiosulphate

**Answer: D**



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**159.** Write the conditions to maximise the yield of  $H_2SO_4$  by contact process.

- A. Low temperature, high pressure and high concentration of reactants
- B. Low temperature, low concentration of reactants and low pressure
- C. High temperature, high pressure and high concentration of reactants
- D. Low temperature, low pressure and high concentration of reactants

**Answer: A**





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**160.** Rhombic sulphur on heating in a test tube or flask

A. sublimes

B. melts to a thin pale yellow liquid and then vaporises

C. melts to a thin dark coloured liquid and then vaporises

D. None of these

**Answer: D**



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**161.** The number of unpaired electrons in the valence shell of the members of oxygen family is \_\_\_\_.

A. 4,2

B. 2,4

C. 3,3

D. 2,3

**Answer: A**



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**162.** If X is a member of chalcogen family, the chemical highest stability of  $X^{2-}$  is exhibited by

- A. oxygen
- B. sulphur
- C. tellurium
- D. selenium

**Answer: A**



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163. Sulphur does not exist as  $S_2$  molecule because

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

**Answer: B**



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**164.** The second most electronegative element of the periodic table belongs to which family and which period respectively ?

- A. Halogen, 2nd
- B. Chalcogen, 3rd
- C. Chalcogens, 2nd
- D. Halogens, 3rd.

**Answer: C**



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**165.** The number of lone pairs and the number of  $S - S$  bonds in  $S_8$  molecules are respectively

A. 8,8

B. 16,8

C. 8, 16

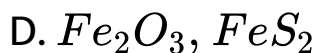
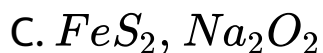
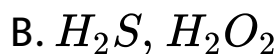
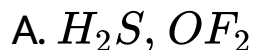
D. 8,4

**Answer: B**



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**166.** In which of the following pairs of species, the oxidation states of oxygen and sulphur is same?



**Answer: C**



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**167.** In which allotropic form of sulphur, puckered  $S_8$  rings are not present ?

- A. Plastic sulphur
- B. Rhombic sulphur
- C. Monoclinic sulphur
- D. Flowers of sulphur.

**Answer: A**



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**168.** Which element of Group 16 cannot form a compound of the type  $XF_6$  ?

A. Selenium

B. Sulphur

C. Oxygen

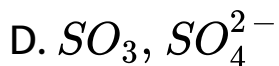
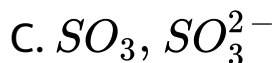
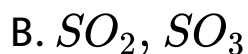
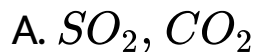
D. Both oxygen and tellurium.

**Answer: B**



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169. In which of the following pairs of compounds, the hybrid state of the central atom is same?

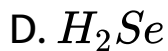
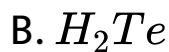


**Answer: C**



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170. Which of the following is least acidic but possesses highest thermal stability ?



**Answer: A**



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171. What is same in various hydrides of chalcogens ?

- A. Molecular shape
- B. Reducing nature
- C. Central bond angle
- D. Magnitude of interparticle forces.

**Answer: A**



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172. Which of the following oxides exists as trigonal planar molecule in gaseous state and a cyclic trimer in the solid state ?



**Answer: C**



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173. The number of S-O-S and O-H links in  $H_2S_2O_7$  molecule are respectively

A. 0,2

B. 1,2

C. 2,2

D. 2,1

**Answer: B**



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174. In which of the following species, S atom assumes  $sp^3$ -hybrid state ?

I( $SO_3$ ), II( $H_2S$ ) , III( $CS_2$ ) and IV( $S_8$ )

A. I, II

B. II, IV

C. II, III

D. III, IV

**Answer: B**



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**175.** In which of the following oxoacids of sulphur, S-O-O-S link is present ?

- A. Caro's acid
- B. Marshall's acid
- C. Sulphurous acid
- D. None of these.

**Answer: B**



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**176.** Which of the following oxoacids contains more than one S-S bonds ?

- A. Dithionic acid
- B. Thiosulfurous acid
- C. Polythionic acid
- D. Peroxydisulfuric acid

**Answer: C**



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177. What is the hybrid state and oxidation state of sulphur in Caro's acid ?

A.  $sp^2$ , +10

B.  $sp^3$ , +10

C.  $sp^3$ , +6

D.  $sp^2$ , +6

**Answer: C**



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**178.** Which of the following does not contain S-S bond ?

- A. Dithionic acid
- B. Pyrosulphuric acid
- C. Thiosulphuric acid
- D. None of these

**Answer: B**



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179. Which of the following is correct order of acid strength among I( $CO_2$ ), II( $SiO_2$ ), III( $SO_3$ ), IV ( $N_2O_5$ )

A.  $II < I < IV < III$

B.  $I < II < III < IV$

C.  $III < II < IV < I$

D.  $II < III < II < I$

**Answer: A**



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**180.** Which of the following oxides is most acidic and most basic respectively?

I( $\text{CaO}$ ), II( $\text{K}_2\text{O}$ ), III( $\text{H}_2\text{O}$ ), IV( $\text{SO}_3$ ), V( $\text{N}_2\text{O}_5$ ), VI ( $\text{SO}_2$ ).

A. IV, II

B. V, I

C. V, VI, III

D. V, II

**Answer: A**



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**181.** The hybrid state and oxidation state of S in  $SF_4$  are respectively

A.  $sp^2$ , +4

B.  $sp^3$ , +6

C.  $sp^3d$ , +4

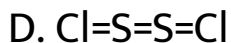
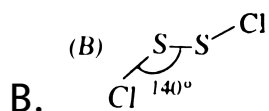
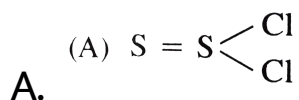
D.  $dsp^2$ , +6

**Answer: C**



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182. Which of the following is correct structure of  $S_2Cl_2$  ?

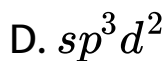
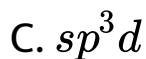
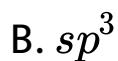
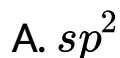


**Answer: B**



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183.  $S\text{Cl}_2$  is the best known dihalide of sulphur, hybrid state of sulphur in  $S\text{Cl}_2$  is



**Answer: B**



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184. What is not applicable to  $TeCl_4$  ?

- A. Te has one lone pair
- B. It is tetrahedral in shape
- C. It reacts with HCl to form  $H_2[TeCl_6]$
- D. The hybrid state of Te is  $sp^3d$ .

**Answer: B**



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**Revision**

1. When  $SO_2$  is passed through acidified  $K_2Cr_2O_7$  solution

- A. The solution turns blue
- B. The solution is decolourised
- C.  $SO_2$  is reduced
- D. Green  $Cr_2(SO_4)_3$  is formed

**Answer: D**



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2. Sugar becomes black when comes in contact with conc.  $H_2SO_4$ . It is because of :

- A. Hydrolysis
- B. Hydration
- C. Decolourisation
- D. Dehydration

**Answer: D**



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3. The acid used in lead storage cells is

A. Phosphoric acid

B. Nitric acid

C. Sulphuric acid

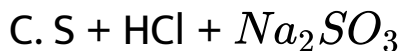
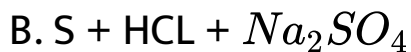
D. Hydrochloric acid.

**Answer: C**



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4. The products of the chemical reaction between  $Na_2S_2O_3$ ,  $Cl_2$  and  $H_2O$  are



**Answer: B**



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5. Sodium thiosulphate ( $Na_2S_2O_3 \cdot 5H_2O$ ) is used in photography to

- A. Dissolving out unreacted silver bromide
- B. Converting silver halides to metallic silver
- C. Reducing solubility of AgBr
- D. Preventing overdeveloping and fogging

**Answer: A**



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6. Why hypo is used in photography?

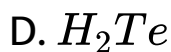
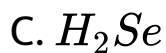
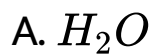
- A. Developing picture
- B. Picture printed
- C. The colour of picture
- D. The fixation of picture

**Answer: D**



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7. Bond angle is minimum for

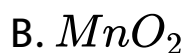
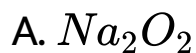


**Answer: D**



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8. Which of the following oxides is a peroxide ?





C. BaO

D.  $SO_2$

**Answer: A**



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9. Which of the following is acidic?

A.  $SO_3$

B.  $N_2O$

C. BeO

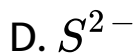
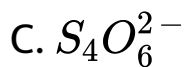
D. HgO

**Answer: A**



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10. iodine oxidises the  $S_2O_3^{2-}$  ion to

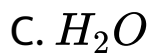
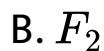


**Answer: C**



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11. Which of the following has the highest dipole moment ?

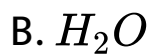


**Answer: C**



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



**Answer: B**



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13. Ozone is not

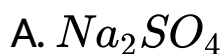
- A. An allotrope
- B. A powerful oxidising agent
- C. Paramagnetic
- D. A bent molecule

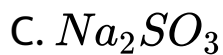
**Answer: C**



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**14.** Which liberates  $SO_2$  with dil.  $H_2SO_4$ ?





**Answer: C**



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**15.** The number of unpaired electrons in the p-subshell of oxygen atom

A. 1

B. 2

C. 3

D. 4

**Answer: B**



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**16.** Which would quickly absorb oxygen?

A. Alkaline solution of pyrogallol

B. Conc.  $H_2SO_4$

C. Lime water

D. Alkaline solution of  $CuSO_4$

**Answer: A**



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**17. Oleum is**

- A. Castor oil
- B. Oil of vitriol
- C. Fuming of  $H_2SO_4$
- D. None of them

**Answer: C**



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**18.** Sulphur molecule is

A. Diatomic

B. Triatomic

C. Tetratomic

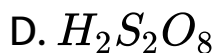
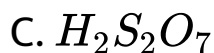
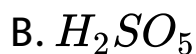
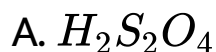
D. Octatomic

**Answer: D**



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19. Which of the following formula represents the fuming sulphuric acid (oleum) ?



**Answer: C**



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20. When sulphur is boiled with  $Na_2SO_3$  solution, the compound formed is

- A. Sodium sulphide
- B. Sodium sulphate
- C. Sodium persulphate
- D. Sodium thiosulphate.

**Answer: B**



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21. Ozone belong to which group of the periodic table ?

A. 15

B. 16

C. 17

D. None

**Answer: B**



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22. Oxygen is more electronegative than sulphur. Yet  $H_2S$  is acidic while  $H_2O$  is neutral. This is because

A. Water is a highly associated compound

B. Molecular mass of  $H_2S$  is more than that of  $H_2O$

C.  $H_2S$  is gaseous under ordinary conditions while  $H_2O$  is a liquid

D. H-S bond is weaker than H-O bond.

**Answer: D**





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23. Polyanion formation is maximum in

A. Nitrogen

B. Oxygen

C. Sulphur

D. Boron

**Answer: C**



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

- A. It oxidises lead sulphide.
- B. It oxidises potassium iodide.
- C. It oxidises mercury
- D. It cannot act as a bleaching agent.

**Answer: D**



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25. All of the following decompose easily on heating to give  $O_2$  except

- A. lead nitrate
- B. potassium chlorate
- C. mercuric oxide
- D. manganese dioxide.

**Answer: D**



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26. Sometimes yellow turbidity appears while passing  $H_2S$  gas even in the absence of II group radicals. This is because of

A. Sulphur is present in the mixture as impurity

B. IV group radicals are precipitated as sulphides

C. Of the oxidation of  $H_2S$  gas by some acid radicals

D. III group radicals are precipitated as hydroxides

**Answer: C**



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27.  $K_2CS_3$  can be called potassium

A. Sulphocyanide

B. Thiocarbide

C. Thiocarbonate

D. Thiocyanate.

**Answer: C**



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28. Sulphuric acid has great affinity for water because it

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

**Answer: C**



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29. Heavy water is manufactured by :

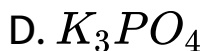
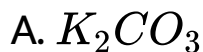
- A. Prolonged electrolysis of water
- B. Dissolving heavy salt in water
- C. Simple distillation of water
- D. Removing impurities of calcium and magnesium from water

**Answer: A**



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30. A certain compound ( $X$ ) when treated with copper sulphate solution yields a brown precipitate. On adding hypo solution the precipitate turns white. The compound is



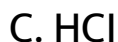
**Answer: B**



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31. When a colourless gas is passed through bromine water only decolourisation takes place

The gas is



**Answer: A**



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32. Which of the following acids has a peroxy linkage?

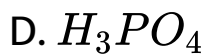
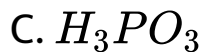
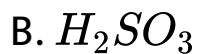
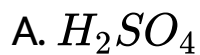
- A. Sulphurous acid
- B. Pyrosulphuric acid
- C. Dithionic acid
- D. Caro's acid.

**Answer: D**



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33. Which has maximum number of oxo groups ?

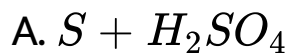


**Answer: A**



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**34.**  $SO_3$  can be obtained by





C.  $CaSO_4 + C$

D. Heating ferric sulphate

**Answer: D**



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**35.** Acidified solutions of sodium thiosulphate are unstable because in thiosulphate

A. The two sulphur atoms are at unstable oxidation state of +2

- B. The two sulphur atoms are at different oxidation state of +6 and -2
- C. The S-S bonds are unstable
- D. Thio compounds contain S in oxidation state of zero.

**Answer: B**



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**36.** Identify the incorrect statement with respect to ozone.

- A. Ozone is formed in the upper atmosphere by a photochemical reaction involving dioxygen.
- B. Ozone is more reactive than dioxygen.
- C. Ozone is diamagnetic whereas dioxygen is paramagnetic
- D. Ozone protects the earth's inhabitants by absorbing gamma-radiations.

**Answer: D**



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37. About  $H_2SO_4$  which is incorrect

- A. Reducing agent
- B. Dehydrating agent
- C. Sulphonating agent
- D. Highly viscous

**Answer: A**



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38. Sodium thiosulphate ( $Na_2S_2O_3 \cdot 5H_2O$ ) is used in photography to

- A. convert silver bromide to metallic silver
- B. convert metallic silver to silver salt.
- C. remove undecomposed AgBr is soluble complex
- D. remove reduced silver

**Answer: C**



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39. Crystalline form of sulphur stable at room temperature is

- A. Rhombic sulphur
- B. Monoclinic sulphur
- C. Plastic sulphur
- D. Prismatic sulphur

**Answer: A**



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40. Which is an oxidising substance amongst the following ?

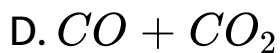


**Answer: D**



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41. What is formed when oxalic acid is dehydrated by *conc.*  $H_2SO_4$  ?



**Answer: D**



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42. The element which has a simple cubic lattice in solid state is

A. Se

B. Te

C. Po

D. None of these

**Answer: C**



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43. Bromine water reacts with  $SO_2$  to form

A.  $H_2O$  and HBr

B.  $H_2SO_4$  + HBr

C. HBr and S

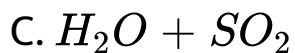
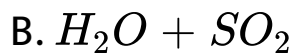
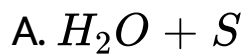
D. S and  $H_2O$

**Answer: B**



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44.  $H_2S$  reacts with  $O_2$  to form



**Answer: A**



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**45.** Permonosulphuric acid is known as

A. Marshall's acid

B. Caro's acid

C. Sulphuric acid

D. None of these.

**Answer: B**



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**46.** Which of the following behaves as both oxidising and reducing agents ?

A.  $H_2SO_4$

B.  $SO_2$

C.  $H_2S$

D.  $HNO_3$

**Answer: B**



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**47.** 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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**48.** Which of the following bonds has the highest energy?

A. Se-Se

B. Te-Te

C. S-S

D. O-O

**Answer: C**



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49. Which show maximum catenation property ?

A. S

B. Se

C. Te

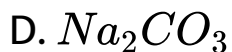
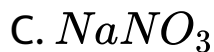
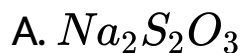
D. O

**Answer: A**



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50. Which of the following does not react with  $AgCl$ ?



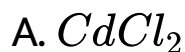
**Answer: C**



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51. Which of the following on reaction with  $H_2S$  does not produce metallic sulphide ?



**Answer: C**



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52. The type of hybridization in water molecule is

A.  $sp$

B.  $sp^2$

C.  $sp^3$

D. None.

**Answer: C**



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53. The oxidation number of sulphur in  $Na_2S_4O_6$  is

.

A.  $\frac{2}{3}$

B.  $\frac{3}{2}$

C.  $\frac{3}{5}$

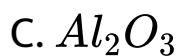
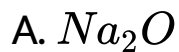
D.  $\frac{5}{2}$

**Answer: D**



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54. Which is most acidic in nature ?



**Answer: C**



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55. Which of the following oxides reacts with HCl and NaOH ?

A. CaO

B. ZnO

C.  $N_2O_5$

D.  $CO_2$

**Answer: B**



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56. Which one of the following reacts with conc.  $H_2SO_4$ ?

A. Au

B. Ag

C. Pt

D. Pb.

**Answer: B**



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57. The correct order of electron affinity of B , C , N and O is

A.  $O > C > N > B$

B.  $B > N > C > O$

C.  $O > C > B > N$

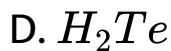
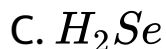
D.  $O > B > C > N$

**Answer: C**



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58. Which of the following hydrides of the oxygen family shows the lowest boiling point?



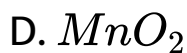
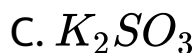
**Answer: B**



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59. By passing  $H_2S$  in acidified  $KMnO_4$  solution we get



**Answer: B**



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60. All the elements of oxygen family are

- A. Non metals
- B. Metalloids
- C. Radioactive
- D. Polymorphic

**Answer: D**



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61. Which type of bond is there in  $H_2S$  molecules ?

- A. Ionic
- B. Covalent
- C. Coordinate
- D. All of these.

**Answer: B**



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**62.** The metal with highest electrical resistance at room temperature is

- A. Pb

B. Te

C. Po

D. Fe.

**Answer: B**



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**63.** Which of the following hydride is most acidic ?

A.  $H_2Te$

B.  $H_2Se$

C.  $H_2O$

D.  $H_2S$

**Answer: A**



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**64.** The hybrid state of sulphur in  $SO_3$  molecule is

A.  $sp^2$

B.  $sp^3$

C.  $sp^2d$

D.  $sp^3d^2$

**Answer: A**



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**65.** By which of the following  $SO_2$  is formed ?

- A. Reaction of dil.  $H_2SO_4$  with  $O_2$
- B. Hydrolysis of dil.  $H_2SO_4$
- C. Reaction of conc.  $H_2SO_4$  with Cu
- D. None

**Answer: C**



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**66.** Electron affinity of sulphur is

- A. more than O and Se
- B. more than O but less than Se
- C. less than O but more than Se
- D. equal to O and Se.

**Answer: A**



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67. Which is the best oxidising agent among the following ?

A. S

B. O

C. Se

D. Te

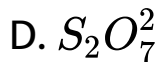
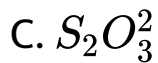
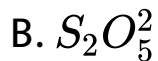
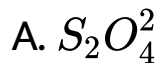
**Answer: B**



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68. There is no  $S - S$  bond in

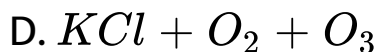
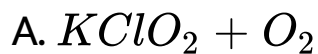


**Answer: B**



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69. On heating  $KClO_3$  we get:



**Answer: B**



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**70.** Which of the following is formed by the action of water on sodium peroxide ?



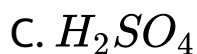


**Answer: C**



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**71.** The compound containing coordinate bond is



D. All

**Answer: D**



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**72.** A group 16 element exists in monoatomic state in the metallic lattice. It also exists in two crystalline forms. The metal is

A. Po

B. S

C. Se

D. Te

**Answer: A**



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**73.**  $Na_2S_2O_3$  is prepared by

A. Reacting  $H_2SO_3$  with NaOH

B. Reducing  $Na_2SO_4$  with S in alkaline medium

C. Heating NaOH and S

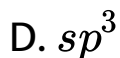
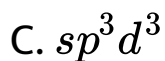
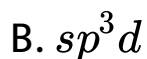
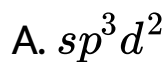
D. Reducing  $Na_2SO_4$  with S in acidic medium.

**Answer: C**



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**74.** In  $SF_4$  the type of hybridization shown by S is

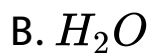


**Answer: B**



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75. Which of the following is not a reducing agent ?

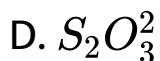
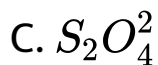
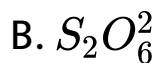
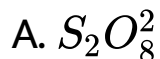


**Answer: C**



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76. Which of the following ions does not have S-S linkage ?



**Answer: A**



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77. Oxygen molecule is



A. diamagnetic with no-unpaired electron.

B. diamagnetic with two unpaired electrons

C. paramagnetic with two unpaired electrons

D. paramagnetic with no unpaired electron.

**Answer: C**



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**78.** When potassium ferrocyanide crystals are heated with concentrated sulphuric acid, the gas evolved is

A.  $SO_2$

B.  $NH_3$

C.  $CO_2$

D. CO

**Answer: D**



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**79.** The number of electrons that are paired in oxygen molecule is

A. 16

B. 12

C. 14

D. 7

**Answer: C**



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**80.** The shape of the molecule  $SF_2Cl_2$  is

A. trigonal bipyramidal

B. cubic

C. octahedral

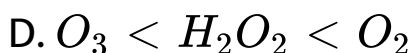
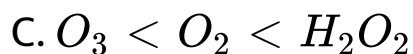
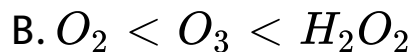
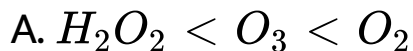
D. tetrahedral

**Answer: C**



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81. The correct order of  $O - O$  bond length in  $O_2$ ,  $H_2O$  and  $O_3$ .

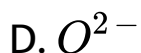
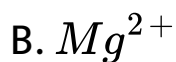
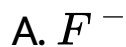


**Answer: B**



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**82.** Which of the following has the largest ionic size?

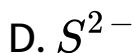


**Answer: D**



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83. Which of the following isoelectronic ions has the lowest ionization energy?

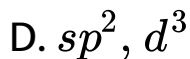
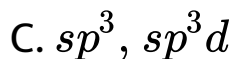
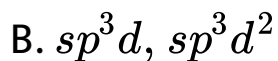
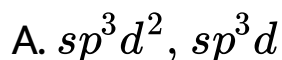


**Answer: D**



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84. States of hybridization of P in  $PF_5$  and S in  $SF_6$  are respectively?



**Answer: B**



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85. Atomicity of sulphur in rhombic sulphur is

A. 1

B. 2

C. 4

D. 8

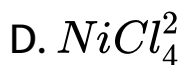
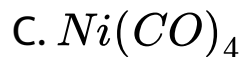
**Answer: D**



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86. Which of the following is not tetrahedral ?



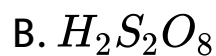
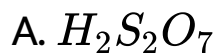


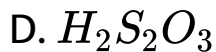
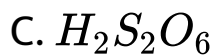
**Answer: A**



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**87.** There is S-S bond in



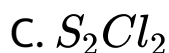


**Answer: C**



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**88.** The compound of sulphur that can be used as refrigerant is



D.  $H_2SO_4$

**Answer: A**



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**89.** Which of the following causes damage to the building containing calcium and responsible for cough and choking in human?

A. Sulphur

B. Carbon

C. Nitrogen dioxide

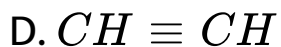
D. Sulphur dioxide.

**Answer: D**



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**90.** Which of the following is not linear ?



**Answer: B**



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**91.** Number of bonds in  $SO_2$  are

- A. Two  $\sigma$  and two  $\pi$
- B. Two  $\sigma$  and one  $\pi$
- C. Two  $\sigma$  and two  $\pi$  and one lone pair
- D. None of these

**Answer: A**



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92. Oxidation state of oxygen is zero in

A. CO

B.  $O_3$

C.  $SO_2$

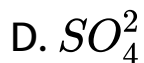
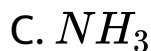
D.  $H_2O_2$

**Answer: B**



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93. Which of the following does not exhibit  $sp^3$ -hybridisation ?



**Answer: A**



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94. The reaction of  $HCOOH$  with *conc.*  $H_2SO_4$  gives :

A. CO

B.  $CO_2$

C. NO

D.  $NO_2$

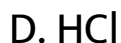
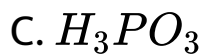
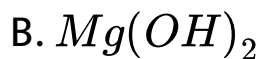
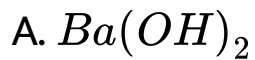
**Answer: A**



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95. Which one of the following is an oxyacid ?

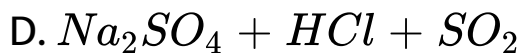
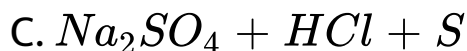
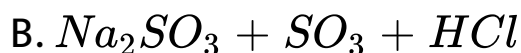
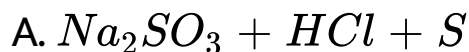


**Answer: C**



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96. The products obtained by passing chlorine through hypo solution are

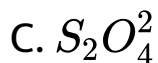
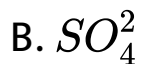


**Answer: C**



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97. Which of the following species is basic and reducing ?



**Answer: A**



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98. The oxidation number of S in  $H_2S_2O_8$  is

A. + 2

B. + 4

C. + 6

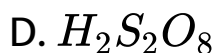
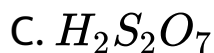
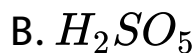
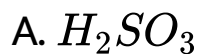
D. + 7

**Answer: C**



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99. Oleum is chemically known as

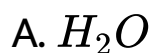


**Answer: C**



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**100.** Which of the following hydrides shows the highest boiling point ?



B.  $H_2S$

C.  $H_2Se$

D.  $H_2Te$ .

**Answer: A**



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**101.** The number of dative bonds in sulphuric acid molecule is

A. 0

B. 1

C. 2

D. 4

**Answer: C**



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**102.** Which of the following is incorrect ?

A.  $O_2$  is weaker oxidant than  $O_3$

B.  $O_2$  has larger bond length than  $O_3$

C. Both  $O_2$  and  $O_3$  are paramagnetic

D.  $O_2$  is linear and  $O_3$  is angular in shape.

**Answer: C**



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**103.** In  $OF_2$ , the number of bond pairs and lone pairs of electrons are respectively,

A. 2,6

B. 2, 8

C. 2,10

D. 2, 9

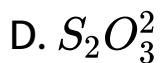
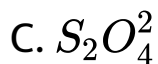
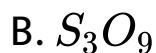
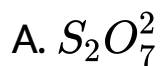
**Answer: B**





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104. There is no  $S - S$  bond in

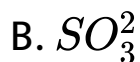


Answer: C



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105. Which of the following has  $p\pi - d\pi$  bonding?

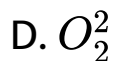


**Answer: B**



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106. The molecular species having highest bond order is



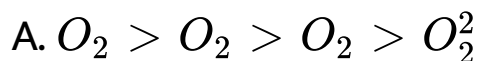
**Answer: B**



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**107.** The bond length in  $O_2^+$ ,  $O_2$ ,  $O_2^-$  and  $O_2^{2-}$

follows the order :



B.  $O_2 > O_2 > O_2 > O_2^2$

C.  $O_2^2 > O_2 > O_2 > O_2$

D.  $O_2 > O_2^2 > O_2 > O_2$

**Answer: B**



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**108.** What is the number of sigma ( $\sigma$ ) and pi ( $\pi$ ) bonds present in sulphuric acid molecule ?

A.  $6\sigma, 2\pi$

B.  $6\sigma, 0\pi$

C.  $2\sigma, 4\pi$

D.  $2\sigma, 2\pi$

**Answer: A**



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**109.** Iron sulphide is heated in air to form A, an oxide of sulphur. A is dissolved in water to give an acid. The basicity of this acid is..

A. 2

B. 3

C. 1

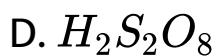
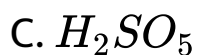
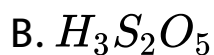
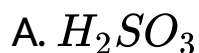
D. Zero

**Answer: A**



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**110.** Caro's acid is



Answer: C

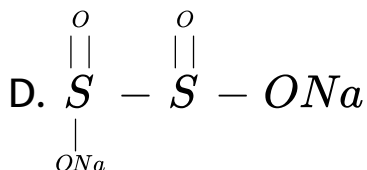
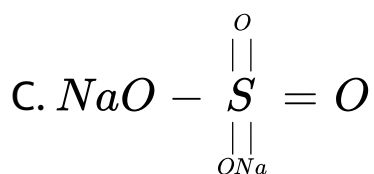


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111. The oxidation number of sulphur is -1 in

A. FeS

B.  $FeS_2$

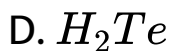
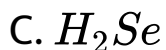


Answer: B



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112. Which of the following has highest thermal stability and maximum acid strength 2



Answer: A



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113. Bleaching action of  $SO_2$  is due to its

A. oxidising property

B. acidic property

C. reducing property

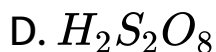
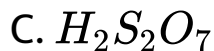
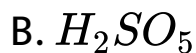
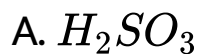
D. basic property

**Answer: C**



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114. Oleum is chemically known as



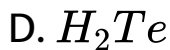
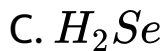
**Answer: C**



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**115.** Which of the following has the highest boiling point?





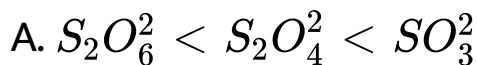
**Answer: A**

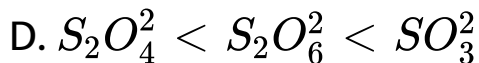
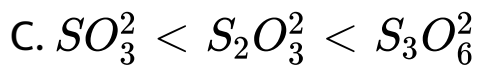


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**116.** The oxidation states of sulphur in the anions

$SO_3^{2-}$ ,  $S_2O_4^{2-}$ , and  $S_2O_6^{2-}$  follow the order





**Answer: B**



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**117.** In the manufacture of sulphuric acid by contact process, Tyndall box is used to

A. convert  $SO_2$  to  $SO_3$

B. test the presence of dust particles

C. filter the dust particles

D. remove impurities.

**Answer: C**



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**118.**  $SO_2$  reacts with chlorine in sunlight to form :

A. Sulphuryl chloride

B. Sulphonyl chloride

C. Sulphur dioxide

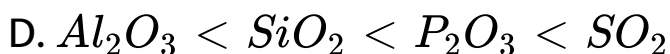
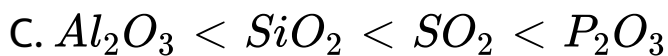
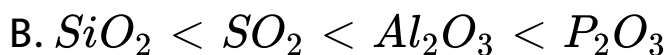
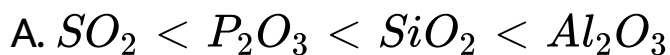
D. none of these

Answer: A



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119. Among  $Al_2O_3$ ,  $SiO_2$ ,  $P_2O_3$  and  $SO_2$  the correct order of acid strength is

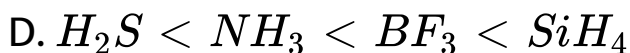
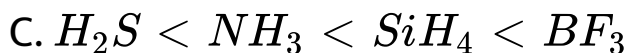
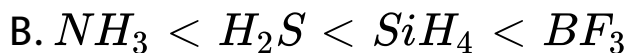
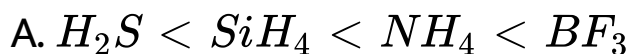


Answer: D



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120. The correct order of bond angles (smallest first) in  $H_2S$ ,  $NH_3$ ,  $BF_3$  and  $SiH_4$  is

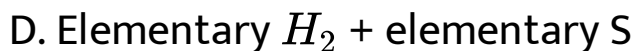
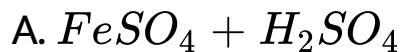


**Answer: A**



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121. How is  $H_2S$  prepared in laboratory?



**Answer: B**



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122. The manufacture of sulphuric acid by the contact process involves the catalyst

A. CdO

B.  $Ag_2O$

C.  $V_2O_5$

D. Platinum coated graphite.

**Answer: C**



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**123.** Photoconductors of xerox machine uses.

A. Mercury

B. Black phosphorus

C. Selenium

D. Tellurium.

**Answer: C**



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124.  $S_2Cl_2$  hydrolyses slowly to form HCl,  $SO_2$  and

X. Which of the following is X ?

A.  $SO_3$

B.  $H_2$

C.  $O_2$

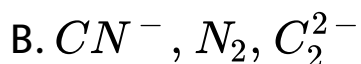
D. S

**Answer: D**



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125. Of the following sets ,which one does not contain isoelectronic species ?



**Answer: C**



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126. A colourless gas with smell of rotten fish is



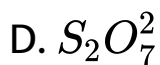
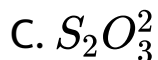
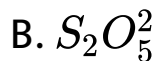
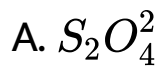
D. None of these

**Answer: B**



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127. There is no  $S - S$  bond in



**Answer: D**



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**128.** How many types of  $F - S - F$  bonds are present in  $SF_4$ ?

A. 2

B. 3

C. 4

D. 5

**Answer: A**



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**129.** The reaction between  $NH_2^\ominus$  and  $N_2O$  gives

A. NO

B.  $N_3$

C.  $N_2O_5$

D.  $NH_2NH_2$

**Answer: B**



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**130.** The element evolving two different gases on reaction with *conc.*  $H_2SO_4$ .

A. P

B. C

C. Hg

D. S

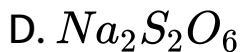
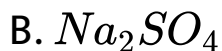


**Answer: B**



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**131.**  $Na_2S_2O_3$  is oxidised by  $I_2$  to



**Answer: D**



**Watch Video Solution**

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

A.  $S_2$  molecule is paramagnetic

B. The vapour at  $200^\circ C$  consists mostly of  $S_8$  ring

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

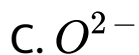
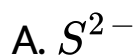
D. The oxidation state of sulphur is never less than +4 in its compounds.

**Answer: D**



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**133.** Which of the following has the largest size?

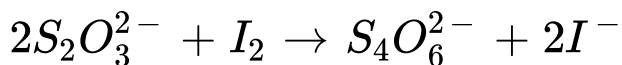


**Answer: D**



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134. The molecular mass of  $Na_2S_2O_3$  and  $I_2$  are the  $M_1$  and  $M_2$  respectively, then what will be the equivalent mass of  $Na_2S_2O_3$  and  $I_2$  in the following reactions ?



- A.  $M_1, M_2$
- B.  $M_2, M_2 / 2$
- C.  $2M_1, M_2$
- D.  $M_1, 2M_2$

**Answer: B**



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135. Identify the incorrect statement from the following:

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

B. ozone absorbs the intense ultraviolet radiation of the sun

C. Depletion of ozone layer is because of its chemical reactions of chloro fluoro alkanes.

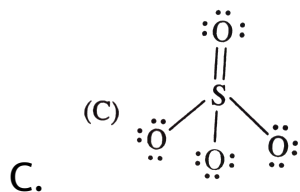
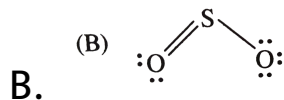
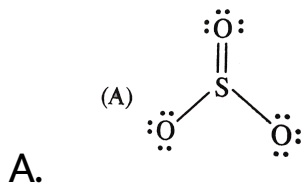
D. Ozone absorbs infra red radiation.

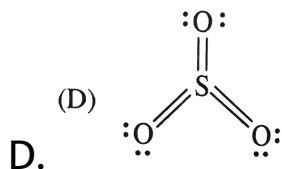
Answer: D



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136. Which of the following is the most preferred and hence of the lower energy for  $SO_3$ ?





**Answer: A**



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**137.** Which of the following statements regarding sulphur is incorrect?

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

- B. At  $600^{\circ}\text{C}$  the gas mainly consists of  $\text{S}_2$  molecules
- C. The oxidation state of sulphur is never less than +4 in its compounds
- D.  $\text{S}_2$  molecule is paramagnetic.

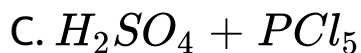
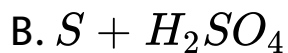
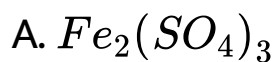
**Answer: B**



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**138.** Sulphur trioxide can be obtained by which of the following reactions:



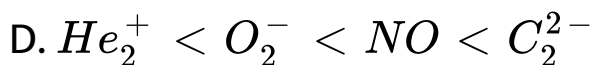
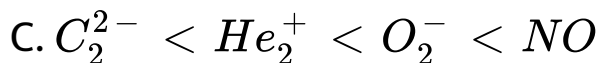
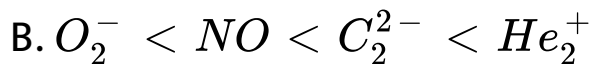
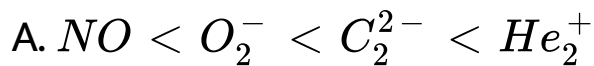


**Answer: A**



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**139.** Four diatomic species are listed in different sequence .Which of these represent the correct order of their increasing bond order?



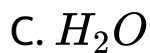
**Answer: C**



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**140.** Which one of the following molecules contains no  $\pi$  - bond ?





**Answer: C**



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**141.** Which of the following is a polar molecule



D.  $SiF_4$

**Answer: A**



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**142.** Which of the following is the wrong statement ?

- A. Ozone is violet-black in solid state
- B. Ozone is diamagnetic gas
- C.  $ONCl$  and  $ONO^-$  are not isoelectronic
- D.  $O_3$  molecule is bent

**Answer: B**



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**143.** The oxyacid of sulphur that contains a lone pair of electrons in sulphur is

- A. sulphurous acid
- B. sulphuric acid
- C. peroxodisulphuric acid
- D. pyrosulphuric acid.

**Answer: C**



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## Selected Straight Objective

1. Both  $CO_2$  and  $SO_2$

A. turns lime water milky, however on passing excess of the gas, the solution becomes clear

B. are colourless

C. support the combustion of a burning magnesium ribbon.

D. turns acidified  $K_2Cr_2O_7$  solution green.

**Answer: A::B::C**



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2.  $SO_2$  acts as

A. oxidising agent

B. reducing agent

C. bleaching agent

D. disinfectant.

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



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3.  $sp^2$ -hybridisation is involved in the molecule of

A.  $CO_2$

B. CO

C.  $SO_3$

D.  $SO_2$

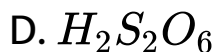
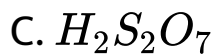
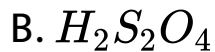
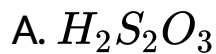
**Answer: C::D**



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4. The oxy acid(s) of Shaving -S-S-bond are/is



**Answer: B::D**



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5. Pick out the correct statement(s)

- A.  $SO_2$  has a bent structure
- B.  $SO_3$  has a triangular planar structure
- C.  $SF_4$  has a tetrahedral structure
- D.  $H_2S$  has a bent structure

**Answer: A::B::D**



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6. In its compounds, oxygen can show oxidation state ( $s$ ) of

- A.  $-1$

B.  $-2$

C.  $+1$

D.  $+2$

**Answer: A::B::C**



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7. The catalysts which can be used in the manufacture of  $H_2SO_4$  are

A. Oxides of nitrogen

B.  $V_2O_5$

C. Platinised asbestos

D. Fe + Mo.

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



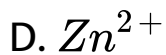
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**8. Which of the following ions will give black ppt. with  $H_2S$  in an acidic solution ?**

A.  $Cu^{2+}$

B.  $Sn^{2+}$

C.  $Pb^{2+}$

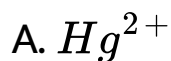


**Answer: B::C**



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9. Which of the following cations will not give ppt. with  $H_2S$  in an acidic solution ?

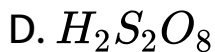
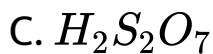
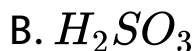
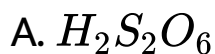


**Answer: B::C**



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**10. Peroxy linkage is present in**

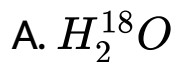


**Answer: A**



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11. Heavy water is



B. Water obtained by repeated distillation



D. Water at  $4^\circ C$ .

**Answer: C**



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



**Answer: C**



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13. The hybridization of sulphur in  $SO_2$  is



A.  $sp$

B.  $sp^3$

C.  $sp^2$

D.  $dsp^2$

**Answer: C**



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**14.** The compound which gives oxygen on moderate heating is

A. cupric oxide

B. mercuric oxide

C. zinc oxide

D. aluminium oxide.

**Answer: B**



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**15.** The first ionisation potential in electron volts of nitrogen and oxygen atoms are respectively given by

A. 14.6,13.6

B. 13.6,14.6

C. 13.6,13.6

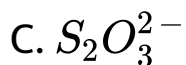
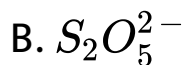
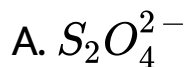
D. 14.6,14.6

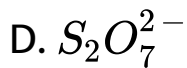
**Answer: A**



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**16.** There is no  $S - S$  bond in





**Answer: D**



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17. The oxidation states of the most electronegative elements in the products of the reaction between  $BaO_2$  and  $H_2SO_4$  are

A. 0 and -1

B. -1 and -2

C. -2 and 0

D. -2 and +1

**Answer: B**



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**18.** Which compound acts as an oxidising as well as reducing agent?

A.  $SO_2$

B.  $MnO_2$

C.  $Al_2O_3$

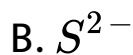
D.  $CrO_3$

**Answer: A**



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**19.** A substance on treatment with dilute  $H_2SO_4$  liberates a colourless gas which produces (I) turbidity with baryta water and (ii) turns acidified dichromate solution green. The reaction indicates the presence of :



D.  $NO_2$

**Answer: C**



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**20.** Hydrolysis of one mole of peroxodisulphuric acid produces

- A. Two moles of sulphuric acid
- B. Two moles of peroxymonosulphuric acid
- C. One mole of sulphuric acid and one mole of peroxymonosulphuric acid

D. One mole each of sulphuric acid, peroxymonosulphuric acid and hydrogen peroxide.

**Answer: C**



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**21.** Sodium thiosulphate is prepared by

- A. Reducing  $Na_2SO_4$  solution with  $H_2S$
- B. Boiling  $Na_2SO_3$  with S in alkaline medium
- C. Neutralising  $H_2S_2O_3$  solution with NaOH



D. Boiling  $Na_2SO_3$  with S in an acidic medium.

**Answer: B**



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22. Which one of the following compounds has  $sp^2$  hybridization?

A.  $CO_2$

B.  $SO_2$

C.  $N_2O$

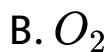
D. CO

**Answer: B**



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**23.** Sodium nitrate decomposes above  $800^{\circ}C$  to give :



**Answer: B**



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24. The oxidation number of sulphur in  $S_8$ ,  $S_2F_2$  and  $H_2S$  respectively are:

A. 0, +1 and -2

B. +2, +1 and -2

C. 0, +1 and +2

D. -2, +1 and 2

**Answer: A**



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25. The geometry of  $H_2S$  and its dipole moment are :

A. Angular and non zero

B. Angular and zero

C. Linear and non zero

D. Linear and zero.

**Answer: A**



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26. Amongst  $H_2O$ ,  $H_2S$ ,  $H_2Se$  and  $H_2Te$ , the one with the highest boiling point is :

- A.  $H_2O$  because of hydrogen bonding
- B.  $H_2Te$  because of higher molecular weight
- C.  $H_2S$  because of hydrogen bonding
- D.  $H_2Se$  because of lower molecular weight.

**Answer: B**



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27. The number of S-S bonds in sulphur trioxide trimer ( $S_3O_9$ ) is

A. Three

B. Two

C. One

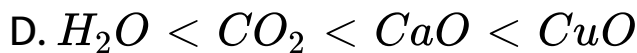
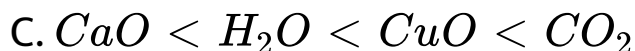
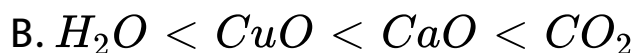
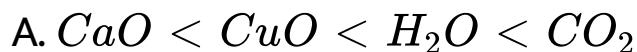
D. Zero

**Answer: D**



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28. Identify the correct order of acidic strength of  $CO_2$ ,  $CuO$ ,  $CaO$  and  $H_2O$ .

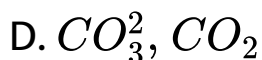
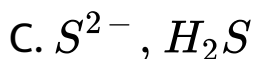
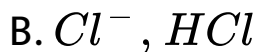
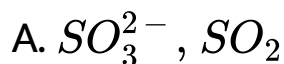


**Answer: A**



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29.  $[X] + H_2SO_4 \rightarrow [Y]$  a colourless gas with irritating smell  $[Y] + K_2Cr_2O_7 + H_2SO_4 \rightarrow$  green solution  $[X]$  and  $[Y]$  are



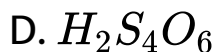
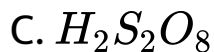
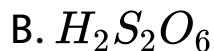
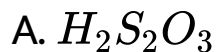
**Answer: A**



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30. The acid having O - O bond is

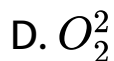
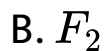


Answer: C



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31. Which of the following molecular species has unpaired electrons(s) ? .



**Answer: C**



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**32. Which of the following statements is true ?**



B. in aqueous medium, HF is stronger acid than

HCl

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

D.  $HNO_3$  acid is stronger acid than  $HNO_2$

**Answer: D**

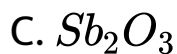


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**33.** Which of the following is the most boric oxide

A.  $SeO_2$

B.  $Al_2O_3$



**Answer: A**



**View Text Solution**

**34.** Angular shape of ozone molecule consists of

A. 1 sigma bond and 1 pi bond

B. 2 sigma bonds and 1 pi bond

C. 1 sigma bond and 2 pi bonds

D. 2 sigma bonds and 2 pi bond.

Answer: B



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## Matrix Match

1. Match the following columns

Column I

- (A)  $\text{SO}_2$
- (B)  $\text{SO}_3$
- (C)  $\text{O}_3$
- (D)  $\text{O}_2$

Column II

- p.* Acidic in nature
- q.* Oxidising agent
- r.* Reducing agent
- s.* Bleaching agent



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## 2. Match the following Columns

### Column I

- (A)  $\text{H}_2\text{S}_2\text{O}_2$
- (B)  $\text{H}_2\text{S}_2\text{O}_3$
- (C)  $\text{H}_2\text{S}_2\text{O}_7$
- (D)  $\text{H}_2\text{S}_2\text{O}_8$

### Column II

- p.* S—O—S linkage
- q.* Diprotic
- r.* S = S linkage
- s.* S—linkage



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## Integer

1. The difference in the oxidation numbers of two types of sulphur atoms in  $\text{Na}_2\text{S}_4\text{O}_6$  is.....



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2. In  $OF_2$ , the number of bond pairs and lone pairs of electrons are respectively,

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3. Number of perox group present in Marshall's acid is

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4. Number of S-S bond in  $S_2O_7^{2-}$

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## Reason Assertion

1. Assertion (A) : In Group 16, oxygen has highest electron affinity.

Reason (R ) : Oxygen has the smallest atomic radius in the group.

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

B. Both A and R true and R is not a correct explanation of A



C. A is true but R is false

D. A is false but R is true

**Answer: B**



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2. Assertion (A) : When KBr is heated with conc.  $H_2SO_4$ , HBr is displaced.

Reason (R) :HBr is a weaker acid than conc.  $H_2SO_4$ .

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. Both A and R are false

**Answer: D**



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3. Assertion (A) : When KI is heated with conc.  $H_2SO_4$ ,  $I_2$  and not HI is produced.

Reason (R) : Conc.  $H_2SO_4$  is a strong oxidising agent and as such oxidises the HI produced.

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: A**



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4. Assertion (A) :  $H_2S$  is more acidic than  $H_2O$ .

Reason (R) : H-S bond is more polar than H-O bond.

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: B**



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5. Assertion (A) : Among the hydrides of group 16, water has the lowest melting point and boiling point.

Reason (R) : It is due to least molecular mass.

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. Both A and R are false

**Answer: D**



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**6. Assertion (A) :** When a test tube containing sulphur (m.p. 387.5 K) at 455 K is inverted, nothing comes out.

**Reason(R) :** Molten sulphur when come in contact with air burns instantly to give  $SO_2$

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: C**



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7. Assertion (A) : Ordinary sulphur exists as a planar eight membered ring,  $S_8$ .

Reason (R) :  $p\pi - p\pi$  bonding is not possible in sulphur.

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: D**



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8. Assertion (A) :  $BaCl_2$  (aq) gives white ppt. of BaS with a solution containing  $S^{2-}$  ions.

Reason (R) : BaS is a white coloured insoluble compound

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. Both A and R are false

**Answer: D**



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**9.** Assertion (A) : Conc.  $H_2SO_4$  cannot be used to prepare HI from KI.

Reason (R) : Conc.  $H_2SO_4$  is a strong oxidising agent.

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: A**



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**10.** Assertion (A) : When  $\text{NaCl(s)}$  is heated with conc.  $\text{H}_2\text{SO}_4$ ,  $\text{Cl}_2$  is produced.

Reason (R) : Conc.  $\text{H}_2\text{SO}_4$  oxidises the HCl produced to  $\text{Cl}_2$ .

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: B**



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11. Assertion (A) : Dinegative anion of oxygen ( $O^{2-}$ ) is quite common but di-negative anion of sulphur  $S^{2-}$  is less common.

Reason (R) : Covalency of oxygen is two.

- A. Both A and R true and R is the correct explanation of A
- B. Both A and R true and R is not a correct explanation of A
- C. A is true but R is false
- D. A is false but R is true

**Answer: B**



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12. Assertion: Reaction of  $SO_2$  and  $H_2S$  in the presence of  $Fe_2O_3$  catalyst gives elemental sulphur.

Reason:  $SO_2$  is a reducing agent.

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: B**



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**13.** Statement -1 : Ozone is a powerful oxidising agent in comparison to  $O_2$ .

Statement -1 :  $O_3$  molecules is diamagnetic but  $O_3^-$  is paramagnetic.

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: B**



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14. Assertion (A) The O-O bond length in  $H_2O_2$  is shorter than that in  $O_2$ .

Reason (R )  $H_2O_2$  is ionic compound.

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: D**





15. Assertion : All F - S - F angle in  $SF_4$  are greater than  $90^\circ$  but less than  $180^\circ$ .

Reason : The lone pair -bond pair repulsion is weaker than bond pair -bond pair repulsion

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: C**



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**16.** Assertion:  $SiF_6^{2-}$  is known but  $SiCl_6^{2-}$  is not.

Reason: Size of fluorine is small and its lone pair of electrons intersects with d-orbitals of  $Si$  strongly.

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: A**



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17. Assertion (A) :  $SeCl_4$  does not have a tetrahedral structure.

Reason (R) : Se in  $SeCl_4$  has two lone pairs.

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

B. Both A and R true and R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: C**



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**Preparatory Package**

1. The element which shows maximum catenation in Group 16 is

A. O

B. S

C. Se

D. Po.

**Answer: B**



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2. The element used to coat photosensitive drum in photostat machines is

A. Po

B. Te

C. Se

D. Cs

**Answer: C**



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3. The element of Group 16, which never shows negative oxidation state is

A. Po

B. Te

C. Se

D. None of these.

**Answer: A**



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4. The oxidation state not shown by oxygen is

A. -2

B. -1

C.  $-1/2$

D. +3

**Answer: D**



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5. Normal melting point and boiling point of rhombic sulphur are 387.5 K and 717.6 K respectively. When sulphur is heated in a test tube to 455 K and the test tube is inverted, the content which pours out is

- A. plastic sulphur
- B. molten sulphur
- C. monoclinic sulphur
- D. None of these

**Answer: D**



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6.  $S^{2-}$  Cannot be tested with

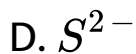
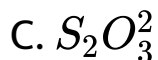
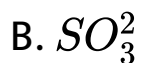
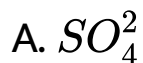
- A.  $BaCl_2$  solution
- B. lead acetate solution
- C. sodium nitroprusside
- D. dil.  $H_2SO_4$  test.

**Answer: A**



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7. Which of the following ions does not give white ppt. with  $BaCl_2$  (aq) ?



**Answer: D**



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8. Water has maximum density at

A. 273 K (in liquid state)

B. 298 K

C. 373 K (in liquid state)

D. None of these.

**Answer: D**



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9. The most electronegative element in Group 16 is

A. O

B. S

C. Se

D. Po

**Answer: A**



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**10.** The element with highest electron affinity in Group 16 is

A. O

B. S

C. Se

D. Po

**Answer: B**



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**11.** The element with highest m.p. and b.p. in Group 16 is

A. Po

B. Te

C. Se

D. S

**Answer: B**



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**12.** The most acidic oxide of Group 16 element is

A.  $SO_2$

B.  $SeO_2$

C.  $TeO_2$

D.  $PoO_2$



**Answer: A**



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**13.** The reason why conc.  $H_2SO_4$  is used to prepare other acids like HCl,  $HNO_3$  etc., is that

- A.  $H_2SO_4$  is a stronger acid than these acids
- B.  $H_2SO_4$  is a strong dehydrating agent
- C.  $H_2SO_4$  is a strong oxidising agent
- D.  $H_2SO_4$  has a higher boiling point.

**Answer: D**



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14. Conc.  $H_2SO_4$  can be diluted by

- A. adding boiling water to conc.  $H_2SO_4$
- B. adding cold water to conc.  $H_2SO_4$
- C. passing steam through conc.  $H_2SO_4$
- D. None of these.

**Answer: D**



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