



## CHEMISTRY

### BOOKS - TARGET CHEMISTRY (HINGLISH)

#### REDOX REACTIONS

#### Classical Thinking

1. Which of the following represents a chemical reaction ?

- A. Oxidation -reduction reaction
- B. Acid-base neutralization reaction
- C. Precipitation reaction
- D. All of these

**Answer: D**



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2. Oxidation involves

- A. loss of electrons
- B. gain of electrons
- C. increase in the valency of negative part
- D. decrease in the valency of positive part

**Answer: A**



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3. A metal ion  $M^{+2}$  loses 3 electrons its oxidation number will be

- A. +3
- B. +5
- C. 0

D. - 3

**Answer: B**



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4. In the course of a chemical reaction an oxidant -

A. loses electron(s)

B. gains electron(s)

C. undergoes oxidation

D. combines with oxygen

**Answer: B**



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5. A reducing agent is a substance Which can:

- A. accept electrons
- B. accept protons
- C. donate electrons
- D. donate protons

**Answer: C**

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**6. Which of the following is CORRECT regarding reductant ?**

- A. It causes oxidation of the other chemical species involved in the reaction
- B. Itself undergoes reduction.
- C. it undergoes increase in oxidation number.
- D. It accepts electron(s)

**Answer: C**



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7. For the reaction,  $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$  which of the following is the CORRECT statement ?

- A. Zn is reduced to  $Zn^{2+}$
- B. Zn is oxidized to  $Zn^{2+}$
- C.  $Zn^{2+}$  is oxidized to Zn.
- D.  $Cu^{2+}$  is oxidized to Cu.

**Answer: B**



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8. The oxidation number of monoatomic ions is always \_\_\_\_\_.

- A. zero
- B. an even number

C. equal to half of the ionic charge

D. equal to charge of the ions

**Answer: D**

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9. Metals exhibit \_\_\_\_\_ oxidation states in their compounds.

A. always positive

B. always negative

C. always zero

D. either positive, negative or zero.

**Answer: A**

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10. Hydrogen can have \_\_\_\_\_ oxidation number ( s ) .

- A. only -1
- B. only +1
- C. only 0
- D. - 1, 0, + 1

**Answer: D**



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11. An element which never has a positive oxidation number in any of its compounds

- A. boron
- B. oxygen
- C. chlorine
- D. fluorine.

**Answer: D**

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**12.** Oxidation number of nitrogen can be -

A. - 3to +5

B. + 3 and + 5

C. - 3, + 3 and + 5

D. - 3 and + 3

**Answer: A**

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**13.** The oxidation number of C in sucrose ( $C_{12}H_{22}O_{11}$ ) is

A. +4



B. +3

C. +2

D. 0

**Answer: D**



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14. Oxidation number of chlorine in  $HClO_4$  is \_\_\_\_\_.

A. +1

B. -1

C. -7

D. +7

**Answer: D**



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15. The oxidation number of sulphur in  $S_2O_7^{-2}$  is \_\_\_\_\_.

A. +6

B. -6

C. +7

D. +4

**Answer: A**



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16. In which of the following compounds, carbon is in the lowest oxidation state ?

A.  $CH_4$

B.  $CF_4$

C.  $CO_2$

D.  $CCl_4$

**Answer: A**

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17. In which of the following compound chlorine has highest oxidation number ?

A. KCl

B. HClO

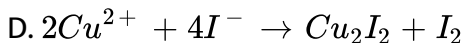
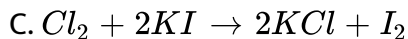
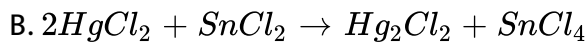
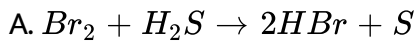
C.  $HClO_2$

D.  $HClO_4$

**Answer: D**

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18. In which of the following reactions, the underlined substance has been oxidised?



Answer: C

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19. In the reaction ,  $2Na + Cl_2 \rightarrow 2NaCl$ , \_\_\_\_\_.

A. Na gets oxidized while  $Cl_2$  gets reduced

B. Na gets reduced while  $Cl_2$  gets oxidized

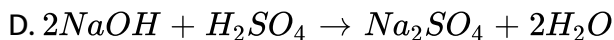
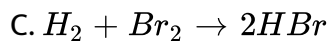
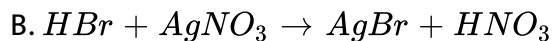
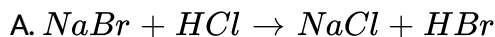
C. only  $Na$  gets reduced

D. only  $Cl_2$  gets oxidised.

Answer: A

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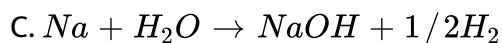
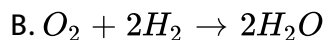
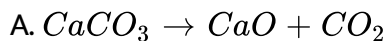
20. Which of the following reactions involve both oxidation and reduction ?

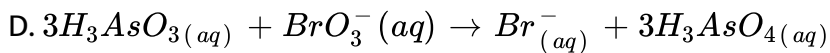


Answer: C

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21. Which of the following is NOT a redox reaction ?



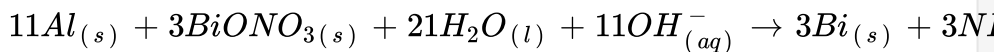


Answer: A

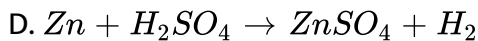
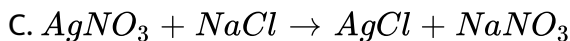
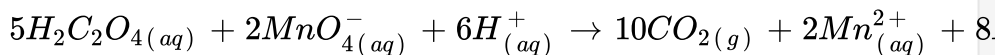
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22. Which of the following is not a redox reaction ?

A.



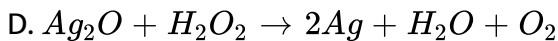
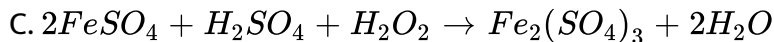
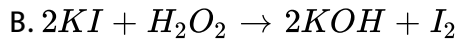
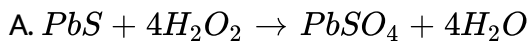
B.



Answer: C

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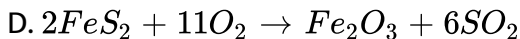
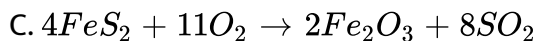
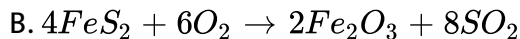
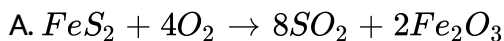
23. The reaction in which hydrogen peroxide acts as a reducing agent is .



Answer: D

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24. Which of the following equation is a balanced equation ?



**Answer: C**



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**25. Which of the following is INCORRECT ?**

- A. Balancing of equations of redox reactions by oxidation number method involves the principle that net change in the total oxidation numbers is zero.
- B. While balancing of equations of redox reactions by ion-electron method, the overall reaction is split into two half reactions.
- C. The equations are balanced with respect to both, atoms as well as charges.
- D. In balancing of equations by oxidation number method, the first step involves writing the unbalanced net equation and balancing all the atoms present in it.



**Answer: D**



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**26.** Burning of methane with oxygen from air is an example of oxidation. It is also called as \_\_\_\_\_.

A. bleaching

B. metallurgy

C. combustion

D. respiration

**Answer: C**



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**27.** Decolourization of coloured material is called as \_\_\_\_\_.

- A. bleaching
- B. corrosion
- C. combustion
- D. respiration

**Answer: A**

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**28.** To remove stains from clothes \_\_\_\_\_ is used.

- A.  $NaCl$
- B.  $NaOH$
- C.  $Na_2O_2$
- D.  $NaOCl$

**Answer: D**

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29. The metallic elements are extracted from their respective ores by \_\_\_\_\_.

- A. precipitation reactions
- B. acid-base neutralisation
- C. redox reactions
- D. complexometric titrations

**Answer: C**



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30. Sulphide minerals are converted to corresponding oxides by \_\_\_\_\_.

- A. cracking
- B. coke

C. roasting

D. bleaching

**Answer: C**

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**31.** Respiration involves \_\_\_\_\_ reaction.

A. only oxidation

B. only reduction

C. redox

D. neutralization

**Answer: C**

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32. Which of the following involves the redox reaction ?

- A. Corrosion of metals.
- B. Extraction of metals from their ores.
- C. Respiration.
- D. All of these

**Answer: D**



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### Critical Thinkin

1. In a conjugate pair of reductant and oxidant, the oxidant has

\_\_\_\_\_

- A. higher oxidation number
- B. lower oxidation number

C. same oxidation number

D. either of these

**Answer: A**

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2. When  $Sn^{2+}$  changes to  $Sn^{4+}$  in a reaction, then \_\_\_\_\_.

A. It is an oxidation as  $Sn^{2+}$  loses two electrons

B. it is an oxidation as  $Sn^{2+}$  gains two electrons

C. it is a reduction as  $Sn^{2+}$  loses two protons

D. it is a reduction as  $Sn^{2+}$  gains two protons

**Answer: A**

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3. A redox reaction is always a / an \_\_\_\_\_.

- A. proton transfer reaction
- B. ion combination reaction
- C. reaction in solution
- D. electron transfer reaction

**Answer: D**

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4. Which of the following represents redox reaction ?

- A.  $NaOH_{(aq)} + \text{dil. HCl} \rightarrow NaCl_{(aq)} + H_2O_{(l)}$
- B.  $KOH_{(aq)} + \text{conc. HNO}_3 \rightarrow KNO_3_{(aq)} + H_2O_{(l)}$
- C.  $BaCl_2_{(aq)} + \text{dil. H}_2\text{SO}_4 \rightarrow BaSO_4_{(s)} + 2HCl_{(aq)}$
- D.  $Fe_{(s)} + CuSO_4_{(aq)} \rightarrow FeSO_4_{(aq)} + Cu_{(s)}$

**Answer: D**

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5. Oxidation number of carbon in carbon suboxide ( $C_3O_2$ ) is :

A.  $+2/3$

B.  $+4/3$

C.  $+4$

D.  $-4/3$

**Answer: B**

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6. Oxidation state of nitrogen is CORRECTLY given for \_\_\_\_\_.

A. 

| Compound | Oxidation state |
|----------|-----------------|
| $HNO_3$  | $-5$            |



- B. Compound    Oxidation state  
 $NH_2OH$     +1
- C. Compound    Oxidation state  
 $(N_2H_5)_2SO_4$     +2
- D. Compound    Oxidation state  
 $Mg_3N_2$     -3

**Answer: D**

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7. In which of the following compounds , the oxidation number of iodine is fractional ?



**Answer: B**

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8. 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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9. The oxidation number of the underlined element in  $K_4\underline{P}_2O_7$  is \_\_\_\_\_.

- A. +3
- B. - 5

C. +5

D. +6

**Answer: C**

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10. What will be the oxidation state of copper in  $YBa_2Cu_3O_7$  , if oxidation state of Y is +3 ?

A. 7/3

B. 7

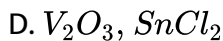
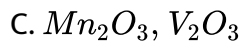
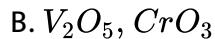
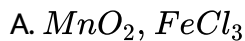
C. 3 and 5

D. 3/7

**Answer: A**

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11. The pair of compounds having metals in their highest oxidation state is \_\_\_\_\_.



**Answer: B**



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12. The oxidation number of Mn is +7 in

A. manganese dioxide

B. manganese chloride

C. manganese sulphate

D. potassium permanganate

**Answer: D**

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**13.** In the reaction,

$4Zn + NO_3^- + 7H_2O \rightarrow 4Zn^{2+} + NH_4^+ + 10OH^-$ , the substance which gets reduced is \_\_\_\_\_.

A.  $Zn$  is reduced to  $Zn^{2+}$

B.  $H_2O$

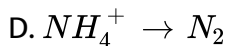
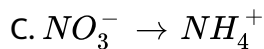
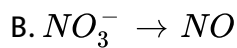
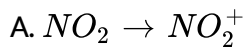
C.  $NO_3^-$

D.  $NH_4^-$

**Answer: C**

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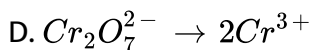
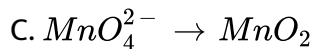
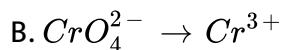
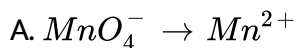
**14.** In which of the following reaction nitrogen is not reduced ?



**Answer: D**

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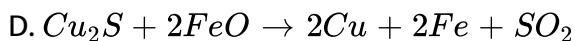
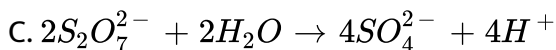
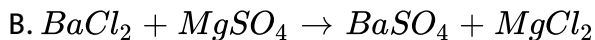
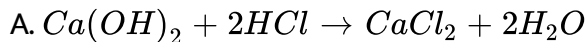
**15. Which of the following involves gain of five electrons ?**



**Answer: A**

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16. Which among the following is a redox reaction ?

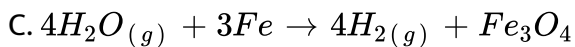
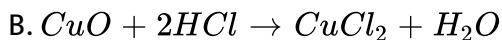
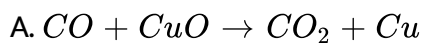


Answer: D



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17. In which of the following reactions, the underlined substance has been reduced ?

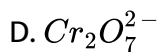
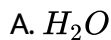
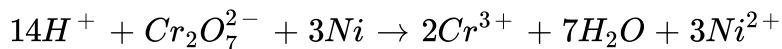




**Answer: C**

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**18.** Which substance is serving as a reducing agent in the following reaction?



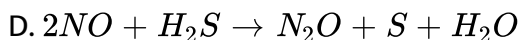
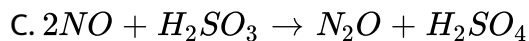
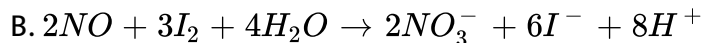
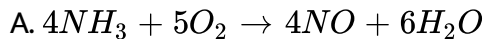
**Answer: B**

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19. Nitric oxide acts as a reducing agent in which of the following reaction

?



**Answer: B**



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20. In a reaction between zinc and iodine in which zinc iodide is formed, what is being oxidised ?

A. Zinc ions

B. Iodide ions

C. Zinc atom

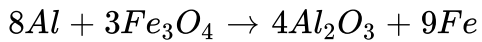
D. Iodine

**Answer: C**



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**21.** In the reaction



the number of electrons transferred from the reductant to the oxidant is

A. 8

B. 4

C. 16

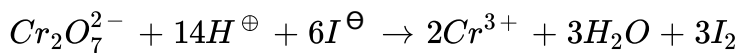
D. 24

**Answer: D**



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22. In the reaction:



Which element is reduced?

A. Cr

B. H

C. O

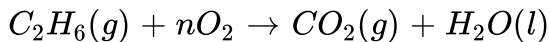
D. I

Answer: A



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23. Consider the following reactions,



In this equation, ratio of the coefficient of  $\text{CO}_2$  and  $\text{H}_2\text{O}$  is

A. 1 : 1

B. 2 : 3

C. 3:2

D. 1:3

**Answer: B**

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24. \_\_\_\_\_ is used as an oxidizing agent to bleach dark hair by a redox reaction.

A.  $H_2O$

B.  $HO_2$

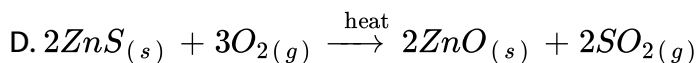
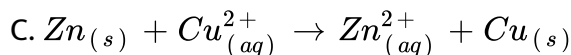
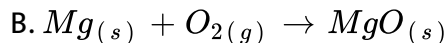
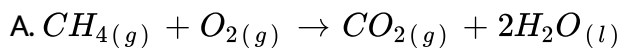
C.  $H_2O_2$

D.  $HO^-$

**Answer: C**

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25. Which of the following CORRECTLY represents the reactions occurring in Daniel cell ?



Answer: C



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26. The overall effect of respiration is similar to that of \_\_\_\_\_.

A. photosynthesis

B. corrosion

C. combustion

D. bleaching

**Answer: C**



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27. The violent reaction between sodium and water is an example of \_\_\_\_\_.

- A. reduction
- B. oxidation
- C. redox reaction
- D. neutralization reaction

**Answer: C**



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28. Hydrogen acts as an oxidizing agent when it is reacted with \_\_\_\_\_.

- A. iodine to give hydrogen iodide
- B. lithium to give lithium hydride
- C. nitrogen to give ammonia
- D. sulphur to give hydrogen sulphide

**Answer: B**

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**29.** Which of the following is a redox reaction ?

- A. Reaction of  $H_2SO_4$  with NaOH
- B. Formation of  $O_3$  from  $O_2$  by lightning in atmosphere
- C. Formation of nitric oxide from nitrogen and oxygen by lightning
- D. Evaporation of  $H_2O$ .

**Answer: C**

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## Competitive Thinking

1. Identify the element which can have highest oxidation numbers

A. N

B. O

C. Cl

D. C

**Answer: C**



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2. The oxidation state of  $Fe$  in  $Fe_3O_8$  is

A.  $+3/2$

B.  $+4/5$



C.  $+15/4$

D.  $+16/3$

**Answer: D**



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3. Oxidation state of oxygen in  $F_2O$  is

A.  $+1$

B.  $+2$

C.  $-1$

D.  $-2$

**Answer: B**



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4. The oxidation number of carbon in  $CH_2Cl_2$  is

A. 0

B. +2

C. -2

D. +4

**Answer: A**



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5. The oxidation states of iodine in  $HIO_4$ ,  $H_3IO_5$  and  $H_5IO_6$  are respectively :

A. +1, +3, +7

B. +7, +7, +3

C. +7, +7, +7

D. +7, +5, +3

**Answer: C**

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6. Oxidation number of nitrogen in  $NaNO_2$  is

A. +2

B. +3

C. +4

D. -3

**Answer: B**

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7. The oxidation state of iodine in  $H_4IO_6^-$  is:

A. +7

B. +5

C. +1

D. -1

**Answer: A**



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

A.  $N_2H_4$

B.  $NH_3$

C.  $N_3H$

D.  $NH_2OH$

**Answer: C**



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9. What is the net charge on ferrous ion ?

A. +2

B. +3

C. +4

D. +5

**Answer: A**



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10. The oxidation state of  $Fe$  in  $Fe_3O_8$  is

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

B.  $\frac{4}{5}$

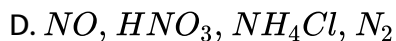
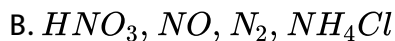
C.  $\frac{5}{4}$

D.  $\frac{16}{3}$

**Answer: D**

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



**Answer: B**

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12. If  $HNO_3$  changes into  $N_2O$ , the oxidation number is changed by

A. +2

B. -1

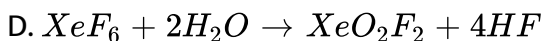
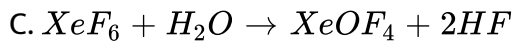
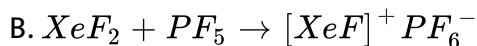
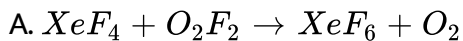
C. 0

D. +4

**Answer: D**

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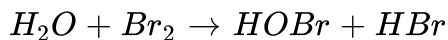
**13. Which of the following reactions is an example of redox reactions ?**



**Answer: A**

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14. Which is the best description of the behaviour of bromine in the reaction given below



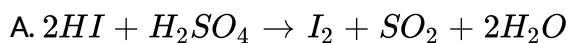
- A. Oxidised only
- B. Reduced only
- C. Proton acceptor only
- D. Both oxidised and reduced.

**Answer: D**

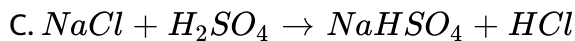
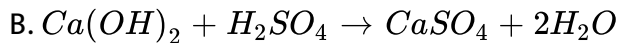


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15. Which of the following chemical reactions depicts the oxidising behaviour of  $H_2SO_4$ ?





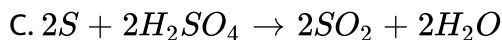
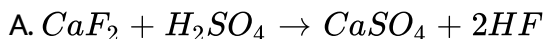


**Answer: A**

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**16.** Hot concentrated sulphuric acid is a moderately strong oxidizing agent.

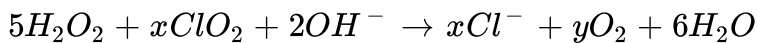
Which of the following reactions does not show oxidizing behaviour?



**Answer: A**

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17. In the balanced equation -



Find  $x$  and  $y$ .

A.  $x = 5, y = 2$

B.  $x = 2, y = 5$

C.  $x = 4, y = 10$

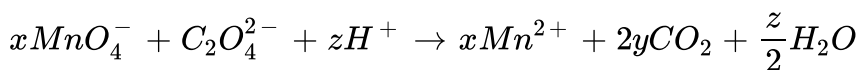
D.  $x = 5, y = 5$

**Answer: B**



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18. Consider the following reaction



The value of  $x$ ,  $y$  and  $z$  in the reaction are respectively

A. 5,2 and 8

B. 5,2 and 16

C. 2,5 and 8

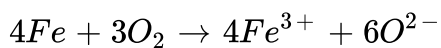
D. 2,5 and 16

**Answer: D**



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**19.** Following reaction describes the rusting of iron



Which one of the following statements is incorrect?

A. This is an example of a redox reaction.

B. Metallic iron is reduced to  $Fe^{3+}$

C.  $Fe^{3+}$  is an oxidizing agent.

D. Metallic iron is a reducing agent.

**Answer: B**

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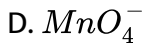
**20.** Which of the following is the most powerful oxidizing agent?



**Answer: A**

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**21.** Which of the following species can function both as oxidizing as well as reducing agent?



**Answer: C**

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## Evaluation Test

1. When an element sulphur atom becomes a sulphide ion,

\_\_\_\_\_.

A. there is no change in the composition of atom

B. it gains two electrons

C. the mass number changes

D. non of these

**Answer: B**

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2. The oxidation number of oxygen in  $KO_3$ ,  $Na_2O_2$  respectively are:

A. 3,2

B. 1,0

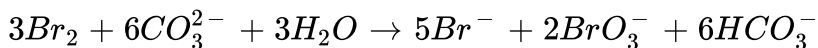
C. 0,1

D.  $-0.33$ ,  $-1$

**Answer: D**

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3. In the reaction

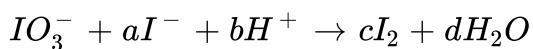


- A. oxidized and carbonate is reduced
- B. reduced and water is oxidized
- C. neither reduced nor oxidized
- D. reduce and oxidized

**Answer: D**

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4. In the balanced chemical reaction,



a,b,c and d respectively correspond to \_\_\_\_\_

- A. 5,6,3,3
- B. 5,3,6,3
- C. 3,5,3,6
- D. 5,6,5,5

Answer: A



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5. Strongest reducing agent is \_\_\_\_\_.



Answer: D



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6. The oxidation state of Mo in  $Mo_2Cl_8^{4-}$  ion is \_\_\_\_\_.





B.  $-2$

C.  $+6$

D.  $+2$

**Answer: C**

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7. Which of the following is a set of reducing agents ?

A.  $HNO_3, Fe^{2+}, F_2$

B.  $F^-, Cl^-, MnO_4^-$

C.  $I^-, Na, Fe^{2+}$

D.  $Cr_2O_7^{2-}, CrO_4^{2-}, Na$

**Answer: C**

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8. The oxidation number of phosphorus in  $Ba(H_2PO_2)_2$  is:-

A. +3

B. +2

C. +1

D. -1

**Answer: C**



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9. Oxidation number of carbon in diamond is \_\_\_\_\_.

A. -4

B. +4

C. 0

D. +2

**Answer: C**

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**10.** The oxidation state of S in Caro's acid ( permono sulphuric acid )

$H_2SO_5$  is \_\_\_\_\_.

A. +8

B. +6

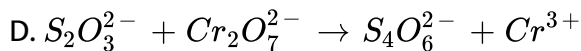
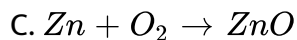
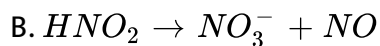
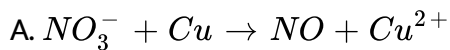
C. +5

D. +4

**Answer: B**

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**11.** Which of the following is a disproportion reaction ?



**Answer: B**

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**12. Which of the following exhibits both +4 and -4 oxidation states ?**

A. Na

B. Si

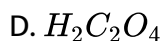
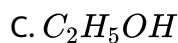
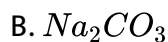
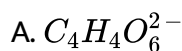
C. Sn

D. Bi

**Answer: B**

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13. In which of the following compounds does carbon exhibit fractional oxidation state ?



**Answer: A**



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14. Which of the following statements is INCORRECT ?

A. In oxidation number method, the net change in the total oxidation number is zero.

B. In oxidation number method, an increase in the oxidation number of the atom undergoing oxidation must be equal to a decrease in the oxidation number of the atom undergoing reduction.

C. oxidation number method is also called half-reaction method.

D. In ion-element method, the overall reaction is split into two half-reactions.

**Answer: C**



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15. In  $ZnNH_4PO_4$ , the element with minimum and maximum oxidation states are \_\_\_\_\_.

A.  $N(-3), P(+5)$

B.  $O(-2), N(+3)$

C.  $P(-3), Zn(+2)$

D.  $O(-2), P(+5)$

**Answer: A**



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