CHEMISTRY

FOR IIT JEE ASPIRANTS OF CLASS 11 FOR CHEMISTRY

HYDROGEN & ITS COMPOUNDS

Example

1. In which of the properties listed below, hydrogen does not show similarity with halogens?

(i) nature of the oxide

(ii) Electropositive character

(iii) Combination with alkali metals

(iv) Atomicity

A. (i) and (ii)

B. (iii) and (iv)

C. (ii) only

D. (i) and (iii)

Answer:

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2. Which of the follwing terms is not correct for hydrogen

?

A. It shows +1 as well as -oxidation states

B. It has very high ionisation enthalpy

C. H^+ ion does exist in free state

D. It is absorbed by palladium in large amounts

Answer: C

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3. The order of reactivity of halogens towards halogenation of alkanes is

A. low

B. high

C. very high

D. almost same

Answer: A

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4. Ortho and para hydrogen differn in

A. in the number of protons

B. in the molecular mass

C. in the nature of spins of protons

D. in the nature of spins of electrons

Answer: C

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5. What are the products formed when H_2 reacts with CuO?

A. $CuO_2 + H_2$

B. $CuH + H_2O$

C. $Cu + H_2O$

D. $CuH_2 + OH$

Answer: C

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6. Nascent hydrogen consists of

A. Hydrogen atoms with excess of energy

B. Hydrogen molecules with excess of energy

C. Hydrogen ions in exited state

D. solvated protons

Answer: A

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7. 500 gms of water contains 6×10^{-3} gms of dissolved $MgSO_4$ in it. Calculate the hardness of water in ppm of $CaCO_3$?

A. 20 ppm

B. 30 ppm

C. 40 ppm

D. 10 ppm

Answer: D

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8. One litre of a sample of hard water contains 1 mg of $CaCl_2$ and 1 mg of $MgCl_2$. Find the total hardness of water in terms of parts of $CaCO_3$ per 10^6 parts of water by mass.

A. 1.05 ppm

B. 1.95 ppm

C. 0.95 ppm

D. 95 ppm

Answer: B

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9. Both temporary and permanent hardness is removed on boiling with

A. $Ca(OH)_2$

B. Na_2CO_3

C. $CaCO_3$

D. CaO

Answer: B

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10. Permutit is :

A. hydrated sodium aluminium silicate

B. sodium hexametaphosphate

C. Sodium silicate

D. sodium meta-aluminate

Answer: A

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11. The temporary hardness of water due to calcium bicarbonate can be removed by adding

A. $CaCO_3$

B. $CaCl_2$

C. HCl

D. $Ca(OH)_2$

Answer: D

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12. Hard water is not fit for washing clothes because

A. it contains Na_2SO_4 and KCl

B. it gives precipitate with soap

C. it contains impurities

D. it is acidic in nature

Answer: B

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13. H_2O has a higher boiling point than that of H_2O due to

A. H_2S molecular weight is more than H_2O

B. Dispersion forces between water molecules are higher than H_2S

C. Strong ionic bonds between water molecules

D. Hydrogen bonds between water molecules

Answer: B

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14. How many hydrogen-bonded water molecule(s) are associated in $CuSO_4.5H_2O$?

A. 1

B. 2

C. 5

D. 4

Answer: A

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15. Which is true about water

A. Hardness can be removed by passing through ion exchange resin

B. It is amphoteric

C. It's presence can be detected by unhydrous copper sulphate

D. All

Answer: D

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16. Calculater the strength of 20V solution of hydrogen peroxide.

A. 0.03

B. 0.06

C. 0.3

D. 0.6

Answer: B

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17. When H_2O_2 is added to ice cold solution of acidified potassium dichromate containing ether. The contents are shaken allowed to stand, then

A. a blue colour is obtained in ether due to formation of $Cr_2(SO_4)_3$

B. a blue colour is obtained in ether due to formation of CrO_5

C. a blue colour is obtained in ether due to formation of CrO_3

D. chromyl chloride is formed.

Answer: B

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18. Mass precentage of deuterium in heavy water is

A. same as that of protium

B. 11.1

C. 20.0

D. cannot be predicted

Answer: C

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19. The bleaching of H_2O_2 are due to its :

A. reducing properties

B. oxidising properties

C. unstable nature

D. acidic nature

Answer: B

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20. H_2O_2 is :

A. an oxidising agent

B. both oxidising and reducing agent

C. reducing agent

D. none of the above

Answer: B

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21. Which of the following statement is incorrect.

A. H_2O_2 can acts as an oxidising agent

B. H_2O_2 can act as reducing agent

C. H_2O_2 has acidic properties

D. H_2O_2 has basic properties

Answer: D

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22. Heavy water is used in nuclear reactors as

A. Source of $\alpha -$ particles

B. Slowing down the speed of high energy neutrons

C. Transporting heat of the reactors

D. Heating purpose

Answer: B

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Check Your Grasp

1. Which isotope of hydrogen contains equal number of proteons and neutrons?

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2. What is 'syn' gas?

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3. Name two complex metal hydrides which are used as reducing agents in organic reactions.

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4. What is hydride gap?

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5. Which is heavier: water or ice?

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6. (a) Name the blue compound formed in the reaction of H_2O_2 with acidified $K_2Cr_2O_7$ in ether? Give reaction.

(b) What is the principle in the bleaching action of H_2O_2 ?

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7. Why H_2O_2 is kept away from dust?

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Evaluate Yourself 1

1. Most abundant element in universe is

A. Oxygen

B. Sulphur

C. Hydrogen

D. Aluminium

Answer: C

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2. The abundance of hydrogen gas in earth's atmosphere is lesser due to

A. Lesser no. of hydrides present in earth's crust

B. Lower gravitational force of earth to hold H_2 gas

C. Lower quantities of water in ocean

D. Lower concentration of water in atmosphere

Answer: B

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3. Which of the following isotopes of hydrogen is most reactive for Cl_2?

A. H

B. D

C. T

D. All of these have same reactivity

Answer: A

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4. The ortho and para forms of hydrogen have ..... and ..... spins respectively

A. Parallel, opposite

B. Opposite, parallel

C. Parallel, parallel

D. Opposite, opposite

Answer: A

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5. Which of the following metals adsorbs hydrogen ?

A. Zn

B. Pd

C. Al

D. K

Answer: B

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Evaluate Yourself 2

1. When two ice cubes are pressed over each other, they unite to form one cube. Which of the following forces is responsible to hold them together ?

A. Hydrogen bond formation

B. van der Waal's forces

C. Covalent attraction

D. Ionic interaction

Answer: A

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2. The process used for the removal of hardness of water is

A. Calgon

B. Baeyer

C. Serpeck

D. Hoope

Answer: A

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3. The bond angle and dipole moment of water respectively are :

A. 109.5°, 1.84 D

B. 107.5°, 1.56 D

C. 104.5°, 1.84 D

D. 102.5°, 1.56 D

Answer: C

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4. Some statements about heavy water are given below :

(i) Heavy water is used as a moderator in nuclear reactors

(ii) Heavy water is more associated than ordinary water.

(iii) Heavy water is more effective solvent than ordinary water

Which of the above statements are correct ?

A. (i) and (ii)

B. (i), (ii) and (iii)

C. (ii) and (iii)

D. (i) and (iii)

Answer: A

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Evaluate Yourself 3

1. H_2O_2 exists in alkaline medium as

A. HO_2^-

B. H^+

C. $H_3O_2^+$

D. O^{2-}

Answer: A

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2. 30% solution of hydrogen peroxide is well known as

A. Perhydrol

B. 10 volume peroxide

C. 70% w/w H_2O_2

D. All of these

Answer: A

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3. Calculate the volume strength of H_2O_2 solution, which normality is 3.57

A. 10V

B. 20V

C. 30V

D. 40V

Answer: B

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4. In the structure of hydrogen peroxide which of the following is correct?

A. $O-H>O-O$ (bond length)

B. Dihedral angle is 111.5 in gas phase

C. Oxygen are bonded by oxide bond

D. All of these

Answer: B

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Conceptual Questions

1. The lightest element in the periodic table is

A. Lithium

B. Fluorine

C. Hydrogen

D. Helium

Answer: C

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2. The element which has no suitable position in the periodic table is

A. Hydrogen

B. Oxygen

C. Carbon

D. Nitrogen

Answer: A

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3. Hydrogen has similarity with alkali metals in

A. Nature of oxide

B. Valence electrons

C. Electro negative nature

D. Tendency to form anion

Answer: B

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4. In which property listed below hydrogen does not resemble alkali metals ?

A. Tendency to form cation

B. Nature of oxide

C. Combination with halogens

D. Reducing character

Answer: B

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5. Hydrogen mainly resembles halogens in the property

A. It contains one electron only in valency shell

B. It is short of one electron to get inert gas configuration

C. It is a diatomic gas like all halogens

D. It exhibits color like halogens

Answer: B

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6. The ionization energy of hydrogen is

A. 1312 KJ mole^{-1}

B. 520 KJ mole^{-1}

C. 495 KJ mole^{-1}

D. 1681 KJ mole^{-1}

Answer: A

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7. The ionization energy of hydrogen is

A. Greater than inert gases

B. Nearer to inert gases

C. Nearer to Halogens

D. Nearer to alkaline earth metals

Answer: C

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8. Which one of the following statement is incorrect

A. Hydrogen forms more compounds than any other element

B. H - has one electron short in comparison with octet configuration

C. The ionization enthalphy of H is 1312 kJ/mol

D. Hydrogen is less reactive when compared with halogens

Answer: B

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9. Which one of the following statement is incorrect

A. Dihydrogen is the most abundant element in the universe.

B. Dihydrogen is the principal element in the solar atmosphere.

C. H_2 is much less abundant in the earth crust.

D. H_2 does not occur in plant and animal tissues

Answer: D

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10. Tritium emits

A. a - particle

B. Positron

C. b - particle

D. Neutron

Answer: C

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11. The radioactive isotope of hydrogen is

A. Protium

B. Tritium

C. Deuterium

D. Proton

Answer: B

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12. The metal that can't displace hydrogen from dil. HCl is :

A. Al

B. Fe

C. Cu

D. Zn

Answer: C

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13. The conversion of atomic hydrogen into ordinary hydrogen is

A. Exothermic change

B. Endothermic change

C. Nuclear change

D. Photochemical change

Answer: A

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14. Which of the following reactions requires high temperature and catalyst ?

A. $H_2 + F_2 \rightarrow 2HF$

B. $H_2 + Cl_2 \rightarrow 2HCl$

C. $H_2 + Br_2 \rightarrow 2HBr$

D. $H_2 + I_2 \rightarrow 2HI$

Answer: D

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15.

$$H_2 + CO + R - CH = CH_2 \rightarrow R - CH_2 - CH_2 - CHO$$

This reaction is known as

A. Hydrogenation

B. Hydroformylation

C. Carbonation

D. Decarboxylation

Answer: B

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16. The fuel used to produce electrical energy in the space rocket saturn V which Neil Armstrong reached the Moon is

A. $CO + O_2$

B. $F_2 + O_2$

C. $CH_4 + O_2$

D. liquid $H_2 + O_2$

Answer: D

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17. During hydrogenation of oils the catalyst commonly used is

A. Pd on $CuCl_2$

B. Fe

C. Ni

D. U_2O_5

Answer: C

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18. Synthetic petrol is prepared by using a mixture.

A. Coal gas + H_2 gas

B. Water gas + H_2 gas

C. Semi water gas

D. Carburatted water gas

Answer: B

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19. Which of the following statements are correct regarding hydrogen?

i) The largest single use of dihydrogen is in the synthesis of NH_3. Which is used in the manufacture of HNO_3 and nitrogenous fertilizers.

(ii) It is used to reduce heavy metal oxide

(iii) It is used as rocket fuel.

(iv) Atomic hydrogen and oxy hydrogen torches find use for cutting and welding purpose.

A. i, iii

B. i, ii

C. i, ii, iv

D. i, ii, iii, iv

Answer: D

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20. Atomic hydrogen is allowed to combine on the surface to be welded to generate the temperature of

A. 400K

B. 3000K

C. 4600K

D. 4000K

Answer: D

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21. Which ionic hydride is stable up to its M.P.?

A. NaH

B. CaH_2

C. LiH

D. BaH_2

Answer: C

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22. Which is polymeric hydride ?

A. CaH_2

B. MgH_2

C. BaH_2

D. SrH_2

Answer: B

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23. Hydrolith, a source of Hydrogen is

A. NaH

B. CaH_2

C. LiH

D. BaH_2

Answer: B

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24. Di-hydrogen reduces CuO to

A. Cu_2O

B. CuH_2

C. $(CuH)_2$

D. Cu

Answer: D

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25. Which of the following hydride have significant covalent character :

A. LiH

B. BeH_2

C. MgH_2

D. All

Answer: B

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26. Which of the following statements are correct about ionic hydrides ?

(i) Crystalline, non-volatile, non-conducting in solid state

(ii) Their melts conduct electricity

(iii) Hydrogen is liberated at anode when their melt is electrolysed

(iv) LiH is less reactive at moderate temperature

A. i, iii

B. ii, iv

C. i, iii, iv

D. i, ii, iii, iv

Answer: D

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27. In which of the following hydrides, the law of constant composition does not hold good

A. Saline hydrides

B. Interstitial Hydrides

C. Covalent Hydrides

D. Molecular Hydrides

Answer: B

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28. Hydrides of which of the following Lattices are different from those of parent metals

A. Ni

B. Pd

C. Ce, Ac

D. All

Answer: D

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29. Which metals are used for storage of hydrogen

A. Pd, Pt

B. Na, Li

C. W, Mo

D. Fe, Ru

Answer: A

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30. Percentage of water present in oceans

A. 2.04

B. 6.2

C. 94.8

D. 97.3

Answer: D

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31. In ice each oxygen is surrounded by four oxygen atoms in _____ manner.

A. Square planar

B. Tetrahedral

C. Trigonal planar

D. Angular

Answer: B

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32. $H_2O + H_2O \Leftrightarrow H_3O^+ + OH^-$ in this reaction water acts as

I) Bronsted Acid II) Bronsted Base

III) Amphoteric oxide

A. I only

B. I, II only

C. II, III only

D. I, II, III

Answer: D

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33. (I) $CuSO_4 + 5H_2O \rightarrow CuSO_4.5H_2O$

(II) $PCl_3 + 3H_2O \rightarrow H_3PO_3 + 3HCl$

The processes I and II are respectively

A. Hydration and dehydration

B. Hydration and Hydrolysis

C. Hydrolysis and Hydrolysis

D. Hydration and hydration.

Answer: B

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34. The temporary hardness of water is due to the presence of

A. Chlorides of Ca and Mg

B. Sulphates of Ca and Mg

C. Bicarbonates of Ca and Mg

D. Carbonates of Ca and Mg

Answer: C

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35. The permanent hardness of water is due to the presence of

A. Sulphates and chlorides of Ca and Mg

B. Carbonates of Ca and Mg

C. Bicarbonates of Ca and Mg

D. Phosphates of Ca and Mg

Answer: A

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36. Which of the following substances cause permanent hardness of water

A. $CaCl_2$

B. $Ca(HCO_3)_2$

C. $CaCO_3$

D. All of these

Answer: A

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37. The formula of Calgon is :

A. $Na_2\left[Na_4(PO_3)_6\right]$

B. $Na_4\left[Na_2(PO_3)_6\right]$

C. $Na_4\left[Na_2(PO_3)_3\right]$

D. $Na_2\left[Na_4(PO_3)_4\right]$

Answer: A

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38. Temporary hardness of water can be removed by adding

A. NaOH

B. Na_2CO_3

C. $Ca(OH)_2$

D. $MgCl_2$

Answer: C

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39. The chemical formula of Zeolite is.....

A. $K_2Al_2Si_2O_8.xH_2O$

B. $CaAl_2Si_2O_8$

C. $Na_2Al_2Si_2O_8.xH_2O$

D. $Na_2\left[Na_4(PO_3)_6\right]$

Answer: C

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40. When Zeolite (Hydrated sodium Alumininum silicate) is treated with hard water sodium ions are exchaged with ..... ions

A. H^+ ions

B. Ca^{+2} ions

C. SO_4^{-2} ions

D. OH^- ions

Answer: B

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41. The formula of exhausted pemutit is

A. $CaAl_2Si_2.\ xH_2O$

B. $Na_2Al_2Si_2O_8.\ xH_2O$

C. $CaB_2Si_2O_8.\ xH_2O$

D. $K_2Al_2Si_2O_8.\ xH_2O$

Answer: C

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42. Permanent hardness of water cannot be removed by

A. Washing soda method

B. Permutit method

C. Ion exchange method

D. Boiling

Answer: D

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43. Exhausted anion exchange resin is revived by using solution of

A. NaOH

B. Na_2CO_3

C. H_2SO_4

D. Both 1 & 2

Answer: D

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44. Exhausted cation exchange resin is regenerated by using solution of moderately concentrated.

A. NaOH

B. Na_2CO_3

C. H_2SO_4

D. NaCl

Answer: C

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45. De-ionized water is prepared by the following method :

A. Clark's

B. Ion exchange

C. Permutit

D. Calgon

Answer: B

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46. Both temporary annd permanent hardness can be removed by using

A. $Ca(OH)_2$

B. Na_2CO_3

C. NaCl

D. $Mg(OH)_2$

Answer: B

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47. One of the electrolyte used for the manufacture of H_2O_2 by electrolysis method

A. Con. H_2SO_4

B. Fused alkali

C. 50 % H_2SO_4

D. $50\ \%\quad aq.\ NaOH$

Answer: C

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48. In the preparation of H_2O_2 by auto oxidation method the starting substance is`

A. 2-ethyl anthra quinone

B. 2-ethyl anthra quinol

C. p-benzo quinone

D. N-methyl aniline

Answer: B

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49. Electrolysis of 50% H_2SO_4 produces

A. $H_2S_2O_8$ at anode

B. H_2SO_4 at anode

C. H_2SO_5 at cathode

D. H_2O_2 at anode

Answer: A

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50. Crystals at 100% H_2O_2 is obtained by cooling 90% H_2O_2 with.

A. Solid CO_2 and ether

B. dil. H_2SO_4

C. Quick lime

D. NaOH+CaO

Answer: C

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51. What is the conc. of H_2O_2 obtained by auto oxidation process?

A. $50\ \%$

B. $1\ \%$

C. $30\ \%$

D. $85\ \%$

Answer: B

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52. Which one of the following is used for laboratory preparation of D_2O_2

A. $K_2S_2O_8$

B. $H_2S_2O_7$

C. H_2SO_4

D. H_2SO_5

Answer: A

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53. H_2O_2 is miscible with water in all proportions and forms a hydrate having composition (M.P:221K)

A. $H_2O_2.\ H_2O$

B. $H_2O_2.2H_2O$

C. $H_2O_2.3H_2O$

D. $H_2O_2.4H_2O$

Answer: A

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54. Perhydrol is

A. $10\ \%\ (w/v) H_2O_2$

B. $30\ \%\ (w/v)$ of H_2O_2

C. $3\ \%\ (w/v) H_2O_2$

D. $100\ \%\ (w/v) H_2O_2$

Answer: B

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55. Hydrogen peroxide has a:

A. Linear structure

B. Closed chain structure

C. Closed book structure

D. Open book structure

Answer: D

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56. The angle between the planes of H_2O_2 molecule in gaseous phase is

A. 101.5°

B. 90°

C. 111.5°

D. $109^\circ 28^1$

Answer: C

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57. In case of H_2O_2 in solid state the angle between the planes containing H-atoms is

A. 100°

B. 90°

C. $109^\circ 28^1$

D. 180°

Answer: B

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58. In H_2O_2 molecule the O-O bond length is (in gas phase)

A. $1.34A^\circ$

B. 1.48°

C. $1.54\,\%^\circ$

D. $1.20A^\circ$

Answer: B

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59. H_2O_2 acts as strong oxidising agent in

A. Acidic Medium

B. In the presence of Glycerol

C. Alkaline medium

D. Neutral medium

Answer: A

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60. The bleaching action of H_2O_2 is due to the following reaction

A. $PbS + 4H_2O_2 \rightarrow PbSO_4 + 4H_2O$

B. $H_2O_2 \rightarrow H_2O + (O)$

C. $H_2O_2 + (O) \rightarrow H_2O + O_2$

D. $H_2O_2 + O_3 \rightarrow H_2O + 2O_2$

Answer: B

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61. When H_2O_2 is added to acidified ferrous sulphate solution

A. Electrons are gained by Fe^{2+}

B. Electrons are lost by Fe^{2+}

C. No loss (or) gain of electrons

D. Iron hydroxide is precipitated

Answer: B

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62. Which of the following is oxidized by H_2O_2 in the alkaline medium

A. HCHO

B. Mn (II) salts

C. Cr(III) salts

D. All of these

Answer: D

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63. When H_2O_2 acts as oxidizing agent, one of the end product is generally

A. O_2

B. H_2O

C. Both 1 & 2

D. O_3

Answer: B

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64. Which of the following is reduced by H_2O_2 in acid medium

A. $KMnO_4$

B. KI

C. $FeSO_4$

D. $K_4\left[Fe(CN)_6\right]$

Answer: A

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65. An aqueous solution of H_2O_2

A. Neutral

B. Strongly acidic

C. Weakly acidic

D. Weakly basic

Answer: C

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66. Which of the following statement is incorrect.

A. H_2O_2 is an oxidising agent

B. H_2O_2 is a reducing agent

C. H_2O_2 is a bleaching agent

D. H_2O_2 is a dehydrating agent

Answer: D

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67. H_2O_2 changes black lead sulphide to white

A. Pb

B. PbO_2

C. PbO

D. $PbSO_4$

Answer: D

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68. H_2O_2 changes aquesous KI solution to

A. HI

B. I_2

C. KI_3

D. H_2

Answer: B

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69. H_2O_2 acts as antiseptic due to its

A. Reducing property

B. Oxidizing property

C. Bleaching property

D. Acidic property

Answer: B

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70. Negative catalyst for the decomposition of H_2O_2 is

A. Silica

B. MnO_2

C. Alumina

D. Acetanilide

Answer: D

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71. Positive catalyst for the decomposition of H_2O_2 among the following is

A. Alcohol

B. Iron

C. Sodium-pyrophosphate

D. Urea

Answer: B

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72. Which compound is used for the manufacture of chemicals like sodium perborate and percarbonate which are used in high quality detergents.

A. H_2S

B. H_2O_2

C. D_2O

D. NaOH

Answer: B

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73. Which of the following is the use of H_2O_2

i) hair bleach, disinfectant and antiseptic.

ii) In the synthesis of hydroquinone, tartaric acid, cephalosporin.

iii) Bleaching agent for textile, paper pulp, leather, oils, fats etc.

(iv) Treatment of domestic and industrial effluents.

A. i, iii

B. i, ii

C. ii, iv

D. i, ii, iii, iv

Answer: D

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74. The boiling point of D_2O is greater than H_2O_2 It is because

A. D_2O has lower Kw value

B. D_2O has a lower dielectric constant

C. D_2O is a associated liquid

D. Inter molecular H-bonds are stronger in D_2O than in H_2O_2

Answer: D

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75. The O-H bond energy in water when compared to O-D bond energy in heavy water is

A. Greater

B. Lesser

C. Equal

D. two times greater

Answer: B

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76. The physical constants which are less for D_2O than H_2O are

A. Freezing point and Boiling point

B. Density and viscosity

C. Solvating ability and dielectric constant

D. Temperature of maximum density

Answer: C

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77. Density of heavy water is maximum at

A. $3.82^\circ C$

B. $101.42^{\circ} C$

C. $11.6^{\circ} C$

D. $4^{\circ} C$

Answer: C

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78. Atoms present in a molecule of heavy water are

A. ${}_{1}H^{1}, {}_{8}O^{16}$

B. ${}_{1}H^{2}, {}_{8}O^{18}$

C. ${}_{1}H^{2}, {}_{8}O^{16}$

D. ${}_{1}H^{1}, {}_{8}O^{18}$

Answer: C

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79. The boiling point of heavy water is

A. $3.82^\circ C$

B. $11.5^\circ C$

C. $100^\circ C$

D. $101.42^\circ C$

Answer: D

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80. In nuclear reactors, heavy water is used as a

A. Fuel

B. Projectile

C. Moderator

D. Coolent

Answer: C

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81. $NaOH + D_2O \rightarrow NaOD + HDO$ is known as

A. Exchange reaction

B. Deuterolysis reaction

C. Hydrolysis reaction

D. Softening reaction

Answer: A

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82. When SO_3 is treated with D_2O, the products are :

A. D_2SO_4

B. D_2SO_3

C. D_2 & H_2SO_4

D. D_2SO_5

Answer: A

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83. When heavy water reacts with calcium carbide, the product formed is

A. Acetylene

B. Calcium hydroxide

C. Deuterium

D. Deutero acetylene

Answer: D

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84. Some reasons are given regarding the limited use of H_2 as fuel

I) Its calorific value is low

II) Its availability in free state is less

III) Its transportation is easy

The correct statements are

A. I, II and III

B. II, III and IV

C. All are correct

D. II and III

Answer: D

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85. Which metal alloy tanks are used for storage of dihydrogen

A. $NaNi_5$

B. $Ti - TiH_2$

C. $Mg - MgH_2$

D. All

Answer: D

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Level I C W

1. The most reactive isotope of H is

A. ${}_1H^1$

B. ${}_1H^2$

C. ${}_1H^3$

D. All have same reactivity

Answer: A

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2. H_2 & D_2 do not differ in

A. Freezing point

B. Boiling point

C. Bond length

D. Bond energy

Answer: C

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3. H_2 gas is not liberated at both cathode and anode by electrolysis of which of the following aqueous solution?

A. NaH

B. HCOONa

C. NaCl

D. LiH

Answer: C

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4. Which of the following reaction produces hydrogen ?

A. $Mg + H_2O$

B. $BaO_2 + HCl$

C. $H_2S_4O_8 + H_2O$

D. $Na_2O_2 + 2HCl$

Answer: A

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5. Ionic hydrides react with water to give

A. Basic solution

B. Acidic solution

C. Neutral solution

D. Hydride ion

Answer: A

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6. Interstitial hydride is formed by

A. Be

B. Li

C. Cr(III) salts

D. K

Answer: C

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7. Ionic hydrides are formed by

A. Transition metals

B. Metalloids

C. Elements of high electropositively

D. Elements of high electropositively

Answer: C

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8. Hardness of water is due to the presence of

A. $CaCl_2$

B. $Mg \quad SO_4$

C. $Ca(HCO_3)_2$

D. All of these

Answer: D

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9. In Clark's method if $Ca(HO)_2$ is used for the removed of temporary hardness of water which is formed

A. NaOH

B. $CaCO_3$

C. $Ca(OH)_2$

D. $Ca(HCO_3)_2$

Answer: C

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10. During the electrolysis of 50% H_2SO_4, the p^H of the solution

A. Increases

B. Decreases

C. Becomes zero

D. Remains constant

Answer: A

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11. Concentration of H_2O_2 by vacuum distillation gives hydrogen peroxide

A. About 99% pure

B. About 90% pure

C. 30% pure

D. About 50% pure

Answer: B

View Text Solution

12. Hydrogen peroxide is

A. Diamagnetic

B. Paramagnetic

C. Ferromagnetic

D. Ferri magnetic

Answer: A

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13. The volume strength of $1 \cdot 5$ N H_2O_2 solution is

A. 8.4 Vol

B. 4.2 Vol

C. 16.8 Vol

D. 5.2 Vol

Answer: A

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14. $H_2O_2 + O_3 \rightarrow H_2O + 2O_2$ in this H_2O_2 acts as

A. Oxidizing agent

B. Reducing agent

C. Dehydrating agent

D. Bleaching agent

Answer: B

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15. An inorganic compound liberates O_2 when heated, turns an acid solution of KI brown and reduces acidified

$KMnO_4$. The substance is

A. H_2O_2

B. D_2O

C. KNO_3

D. $Pb(NO_3)_2$

Answer: A

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16. H_2O_2 acts as an oxidising agent in

A. Neutral medium

B. Acidic medium

C. Alkaline medium

D. Acidic and alkaline medium

Answer: D

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17. H_2O_2 converts potassium ferrocyanide to ferricyanide.

The change observed in the oxidation state of iron is

A. $Fe^{2+} \rightarrow Fe^{3+}$

B. $Fe \rightarrow Fe^{2+}$

C. $Fe^{3+} \rightarrow Fe^{2+}$

D. $Fe^{2+} \rightarrow Fe^{+}$

Answer: A

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18. The percentage of deuterium in heavy water is

A. 22.2

B. 11.2

C. 44

D. 20

Answer: D

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Level I H W

1. The total number of fundamental particles in tritium atom is

A. 4

B. 3

C. 2

D. 1

Answer: A

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2. ${}_1^1H, {}_1^2H$ and ${}_1^3H$ will have the same

A. Mass number

B. Chemical reactivity

C. Electron configuration

D. Nuclear radius

Answer: C

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3. Hydrogen does not combine with

A. Antimony

B. Sodium

C. Bismuth

D. Helium

Answer: D

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4. Which of the halogen has maximum affinity for hydrogen ?

A. F_2

B. Cl_2

C. Br_2

D. I_2

Answer: A

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5. The electron deficient compound is

A. NH_3

B. PH_3

C. B_2H_6

D. C_2H_6

Answer: C

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6. IUPAC name of ammonia

A. Nitrogen hydride

B. Ammonia

C. Azane

D. Hydrazine

Answer: C

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7. The raw material used for preparing permutit is

A. Soda ash

B. Alumina

C. Silica

D. All of the above

Answer: D

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8. Compound obtained by passing CO_2 through BaO_2 in water is

A. CO

B. $Ba(OH)_2$

C. H_2O_2

D. O_2

Answer: C

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9. The volutme of oxygen liberated from 15 ml of 20 volume is

A. 250 ml

B. 300 ml

C. 150 ml

D. 200 ml

Answer: B

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10. 20 volume H_2O_2 solution has a strength of about

A. $30\ \%$

B. $6\ \%$

C. $3\ \%$

D. $10\ \%$

Answer: B

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11. H_2O_2 will oxidise

A. $KMnO_4$

B. PbS

C. MnO_2

D. KCl

Answer: B

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12. Which substance cannot be reduced by H_2O_2

A. $KMnO_4 / H_2SO_4$

B. $K_2Cr_2O_7 / H_2SO_4$

C. Ag_2O

D. Fe^{3+}

Answer: D

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13. Deutero methane is obtained by the deuterolysis of

A. Mg_3N_2

B. CaC_2

C. Al_4C_3

D. Ca_3P_2

Answer: C

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Level Ii C W

1. Which property is lower for deuterium than hydrogen

A. Latent heat of vapourisation

B. Latent heat of fusion

C. Reactivity

D. Atomic weight

Answer: C

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2. The ratio of densities of hydrogen, deuterium and tritium is

A. $3:2:1$

B. $1:2:3$

C. $3:6:1$

D. $6:2:1$

Answer: B

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3. Which combination cannot be used for the preparation of hydrogen gas in the laboratory?

Zn/conc.H_2SO_4 II) $Zn/dil.\ HNO_3$

III) pure Zn/dil. H_2SO_4

IV) granulated Zn/dil. HCl

A. I and II

B. I, II, III

C. III only

D. I and III

Answer: B

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4. High purity ($> 99.95\ \%$) dihydrogen is obtained by

A. Electrolysis of pure water

B. Electrolysis of warm aqueous Barium hydroxide

C. Action of Zn on NaOH

D. Electrolysis of acidulated water

Answer: B

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5. In aqueous solution, H_2 will not reduce :

A. Fe^{3+}

B. Cu^{2+}

C. Zn^{2+}

D. Ag^+

Answer: C

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6. Which one of the following statement is is incorrect

A. H_2 reacts with Cl_2 to form HCl, an electron pair shared between H and Cl

B. Hydrogen is reduced by sodium to form NaH. An electron is transferred from H to Na

C. Hydrogen reduces copper (II) oxide to copper and itself gets oxidized to H_2O

D. Hydroformylation of olefins yields aldehyde which further undergoes reduction to give alcohol.

Answer: B

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7. What is the nature of aqueous solution of NaH

A. Acidic

B. Basic

C. Neutral

D. Amphoteric

Answer: B

View Text Solution

8. Water softened by permutitt process contains

A. Dissolved sodium salts

B. Dissolved gases

C. Does not give good lather with soap

D. Dissolved calcium salts

Answer: C

View Text Solution

9. The process used for the removal of hardness of water is

A. Baeyer

B. Calgon

C. Serpeck

D. Hoope

Answer: B

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10. The ion exchange resin which removes metal ions from hard water consists of giant organic molecule having

A. $-Cl$ group

B. $-COOH$ group

C. $-OH$ group

D. $-NH_2$ group

Answer: B

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11. Zn gives H_2 gas with H_2SO_4 and HCl but not with HNO_3 because

A. Zn acts as an oxidising agent when react with HNO_3

B. HNO_3 is weaker acid than H_2SO_4 and HCl

C. In electrochemical series Zn is above hydrogen

D. NO_3^- is reduced in preference to hydronium ion

Answer: D

Watch Video Solution

12. Triple point of water is

A. 273.16 K

B. 373.15 K

C. 203.12 K

D. 193.16 K

Answer: A

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13. The correct statement regarding structure of ice :

A. Ice has a highly ordered three dimensional hydrogen bonded structure.

B. Each oxygen atom in ice is surrounded tetrahedrally by four other oxygen atoms at a distance of 276 pm.

C. Hydrogen bonding gives ice a rather open structure with wide holes. These holes can hold some other molecules of appropriate size interstitially.

D. All are correct

Answer: D

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14. How many grams of barium hydride must be treated with water to obtain 4.36L of hydrogen at $20^{\circ}C$ and 0.975 atm pressure (Ba=137)?

A. 12.28 g

B. 24.56 g

C. 16.14 g

D. 14.56 g

Answer: B

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15. Limiting compositions of f-block hydrides are

A. MH_2 & $MH3$

B. MH_3 & MH_5

C. MH_2 & MH_8

D. MH_2 & MH_6

Answer: A

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16. The volume strength of 1N solution of H_2O_2

A. 11.2 V

B. 22.4 V

C. 1 V

D. 5.6 V

Answer: D

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17. 3.4 gm of H_2O_2 decomposes, the weight of oxygen liberated from it is

A. 1.6 gm

B. 2.24 gm

C. 1.16 gm

D. 3.2 gm

Answer: A

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18. In which of the following reactions, H_2O_2 acts as a reducing reagent?

A.

$$PbO_{2(s)} + H_2O_{2(aq)} \rightarrow PbO_{(s)} + H_2O_{(l)} + O_{2(g)}$$

B.

$$Na_2SO_{3(aq)} + H_2O_{2(aq)} \rightarrow Na_2SO_{4(aq)} + H_2O_{(l)}$$

C. $2KI_{(aq)} + H_2O_{2(aq)} \rightarrow 2KOH_{(aq)} + I_{2(s)}$

D. All the above

Answer: A

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19. How does H_2O_2 differ from O_3 in its chemical action?

A. In oxidising PbS to $PbSO_4$

B. In liberating I_2 form KI

C. In reducing acidified $KMnO_4$

D. In oxidising $K_4\left[Fe(CN)_6\right]$

Answer: C

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20. The volume of perhydrol which on decomposition gives 1.5 lit of O_2 gas at STP is

A. 25 ml

B. 15 ml

C. 10 ml

D. 0 ml

Answer: B

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21. Weight of H_2O_2 present in 560 ml. of 20 vol. H_2O_2 solution is approximately

A. 69 g

B. 34 g

C. 32 g

D. 3.4 g

Answer: B

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22. While one of the following reactions does not correspond to the preparation of "synthetic gasoline" during the Fischer-Tropsch process?

A. $CO + 3H_2 \rightarrow CH_4 + H_2O$

B. $nCO + 2nH_2 \rightarrow nCH_3OH$

C. $nCO + 2nH_2 \rightarrow C_nH_{2n} + nH_2O$

D. $nCO + (2n + 1)H_2 \rightarrow C_nH_{2n+2} + nH_2O$

Answer: B

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23. In a reaction excess of H_2O is added to 0.1 mole of acidified $KMnO_4$ solution. Then the S.T.P volume of O_2 liberated is

A. 5.6 lit.

B. 6.6 lit.

C. 11.2 lit.

D. 22.4 lit.

Answer: A

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24. 25 ml of H_2O_2 solution were added to excess of acidified KI solution. The iodine so liberated required 20 ml of 0.1 N $Na_2S_2O_3$ solution. Calculate strength in terms of normality and percentage.

A. 0.04 N, $0.136\ \%$

B. 0.08 N, $0.136\ \%$

C. 0.08 N, $0.163\ \%$

D. 0.02 N, $0.163\ \%$

Answer: C

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25. 20 ml of H_2O_2 after acidification with dil H_2SO_4, required 30 ml of N/2 $KMnO_4$ for complete oxidation. Calculate the % of H_2O_2 in gr/lit.

A. 10.75 g/lit

B. 11.75 g/lit

C. 12.75 g/lit

D. 13.75 g/lit

Answer: C

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26. In which of the following reactions H_2O_2 acts as a reducing reagent ?

A. $PbS_{(s)} + 4H_2O_{2(aq)} \xrightarrow{H^+} PbSO_{4(s)} + H_2O(l)$

B. $HOCl + H_2O_2 \xrightarrow{H^+} H_3O^+ + Cl^{-1} + O_2$

C. $Mn^{2+} + H_2O_2 \xrightarrow{OH^-} Mn^{4+} + 2OH^-$

D. $2Fe^{2+} + H_2O_2 \xrightarrow{OH^-} 2Fe^{3+} + 2OH^-$

Answer: B

View Text Solution

Level Ii H W

1. The most abundant and least abundant isotopes of Hydrogen respectively are

A. P, T

B. P, D

C. D, P

D. T, P

Answer: A

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2. Which of the following statements are correct

I) Now-a-days syngas is produced from sewage, sawdust,

scrap wood, news paper etc.

II) The process of producing syngas from coal is called coal gasification.

III) The production of dihydrogen can be increased by treating syngas mixture with steam in the presence of iron chromate catalyst.

IV) 77% of the industrial dihydrogen is produced from petro chemicals

A. I, II

B. III, IV

C. I, III

D. I, II, III, IV

Answer: D

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3. The reaction related to coal gasification

A. $CO + H_2O \xrightarrow{Fe_2O_3 + Cr} CO_2 + H_2$

B. $C + H_2O \xrightarrow[Catalyst]{673k} CO + H_2$

C. $CH_4 + H_2O \xrightarrow{Ni} CO + 3H_2$

D. $C_nH_{2n} + 2nH_2O \xrightarrow[Ni]{270k} nCO + (2n+1)H_2$

Answer: B

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4. The gas(es) used in the hydrogenation of oils in presence of nickel as a catalyst is/are:

A. Methane

B. Ethane

C. Ozone

D. Hydrogen

Answer: D

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5. Electron-deficient hydride is/are

A. BH_3

B. AIH_3

C. BeH_2

D. All

Answer: D

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6. Which of the following pair of ions makes the water hard(temporary) ?

A. $Na^{+}, SO_4{}^{-2}$

B. $Ca^{2+}, HCO_3{}^{-}$

C. $Ca^{2+}, NO_3{}^{-}$

D. $NH_4{}^{+}, Cl^{-}$

Answer: B

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7. The pH of D_2O and H_2O at 298 K is

A. 7.0, 7.0

B. 7.35, 7.0

C. 7.0, 6.85

D. 6.85, 7.35

Answer: B

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8. Which of the following will determine whether the given colourless liquid is water or not ?

A. Melting point

B. Taste

C. Adding phenolphthalein

D. Adding a pinch of anhydrous $CuSO_4$

Answer: B

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9. One ml. of H_2O_2 solution gives 50 ml. of O_2 at NTP, so it is

A. 10 V

B. 25 V

C. 50 V

D. 100 V

Answer: C

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10. H_2O_2 exists as ..... In alkaline medium.

A. HO_2^-

B. $HO_2^{\oplus}$

C. O_2^{2-}

D. Both 1 & 3

Answer: D

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11. The reagent(s) used for softening the temporary hardness of water is (are):

A. $Ca_3(PO_4)_2$

B. $Ca(OH)_2$

C. $NaCO_2$

D. $NaOCI$

Answer: A

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12. Hydrogen peroxide in its reaction with KIO_4 and NH_2OH respectively, is acting as a

A. reducing agent, oxidising agent

B. reducing agent, reducing, agent

C. oxidising agent, reducing agent

D. oxidising agent, oxidising agent

Answer: A

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13. Radioactive elements emit α, β and γ rays and are characterised by their half - lives. The radioactive isotope of hydrogen is

A. protium

B. deuterium

C. tritium

D. hydronium

Answer: C

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Level 3

1. Which cannot be oxidised by H_2O_2?

A. Na_2SO_3

B. PbS

C. KI

D. O_3

Answer: D

View Text Solution

2. Radioactive isotope of hydrogen is

A. uranium

B. deuterium

C. tritium

D. None of these

Answer: C

View Text Solution

3. Which one of the following is correct order?

(A) $T_2 > D_2 > H_2$ (order of BP)

(B) $T_2 > D_2 > H_2$ (order of BE)

(C) $T_2 = D_2 = H_2$ (order of BL)

(D) $T_2 < D_2 < H_2$ (order of reactivity with Cl_2)

A. A, B & C

B. A, B, C & D

C. A, B

D. D, B & C

Answer: B

View Text Solution

4. Calgon used as water softener is

A. $Na_2\left[Na_4(PO_3)_6\right]$

B. $Na_4\left[Na_2(PO_3)_6\right]$

C. $Na_2\left[Na_4(PO_4)_5\right]$

D. $Na_4\left[Na_4(PO_4)_6\right]$

Answer: A

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5. Hardness of water is due to presence of salts of

A. Na^+ and K^+

B. Ca^{2+} and Mg^{2+}

C. Ca^{2+} and K^+

D. Ca^{2+} and Na^+

Answer: B

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6. Hydrogen can be prepared by the action of dil. H_2SO_4 on

A. copper

B. iron

C. lead

D. mercury

Answer: B

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7. Which will produce hard water ?

A. Saturation of water with $CaCO_3$

B. Saturation of water with $MgCO_3$

C. Saturation of water with $CaSO_4$

D. Addition of Na_2SO_4 to water

Answer: C

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8. Which of the following statement is correct ? Dielectric cosntant of H_2O_2

A. increases with dilution

B. decreases with dilution

C. is unaffected on dilution

D. None of the above

Answer: A

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9. If 11.1 mg of $CaCl_2$ and 12 mg of $MgSO_4$ are present in 2 L of water, what is its hardness (in gram $CaCO_3$/ppm)?

A. 5

B. 10

C. 15

D. 20

Answer: B

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10. Which of the following is incorrect

A. H_2O_2 is a weak acid

B. H_2O_2 is a weak alkali

C. H_2O_2 acts as on oxidising agent

D. H_2O_2 is a reducing agent

Answer: B

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11. Match the following

Column I	Column II
(A) 10 vol H_2O_2	(1) Perhydrol
(C) 30 vol H_2O_2	(2) 5.358 N
(C) 30 vol H_2O_2	(3) 1.785 M
(D) 100 vol H_2O_2	(4) 3.03%

The correct match is

A. `A-4, B-3, C-2, D-1

B. A-1, B-2, C-3, D-4

C. A-1, B-3, C-2, D-4

D. A-4, B-2, C-3, D-1

Answer: A

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12. Which of the following is not correct regarding the electroplytic perparation of H_2O_2?

A. Lead is used as cathode

B. 50% H_2SO_4 is used.

C. Hydrogen is liberated at anode.

D. Sulphuric acid undergoes oxidation.

Answer: C

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13. Blackened oil painting can be restored into original form by the action of

A. chlorine

B. BaO_2

C. H_2O_2

D. H_2O

Answer: C

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14. Which one of the following is non-reducting?

A. H_2S

B. BaO_2

C. H_2Se

D. H_2O

Answer: D

View Text Solution

15. How many mL of perhydrol is requried to produce sufficient oxygen which can be used to completely convert 2 L of SO_2 gas of SO_3 gas?

A. 10 mL

B. 5 mL

C. 20 mL

D. 30 mL

Answer: A

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16. Which one of the following statements is incorrect with regard to ortho and para dihydrogen?

(1) They are nuclear spin isomers.

(2) The ortho isomer has zero nucolear spin whereas the para isomer has one nuclear spin.

(3) The para isomer is favoured at low temperatures.

(4) The thermal conductivity of the para isomer is 50% greater than that of the ortho isomer.

(5) It is never possible to obtain 100% pure ortho isomer.

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17. Which of the following statements is correct? Dielectric constant of H_2O_2?

A. Zeolites have a more closed struture than feldspar.

B. $H_4As_2O_7$ is an 'ortho' acid.

C. Pseudo-alum does not have Na^+ and K^+.

D. Superphosphate of lime is $4Ca(H_2PO_4)_2$.

Answer: C

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18. Ortho and para hydrogen have :

A. identical chemical properties but different physical properties

B. identical physical and chemical properties.

C. identical physical properties but different chemical properties.

D. different physical and chemical properties.

Answer: A

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19. What is heavy water?

A. $H_2^{18}O$

B. $H_2^{16}O$

C. H_2O_3

D. D_2O

Answer: D

Watch Video Solution

20. Hydrogen sulphide is acidic while water is neutral. The reason is

A. molecular weight of H_2S is more than H_2O.

B. water molecules associate, while H_2S molecules does not.

C. H-S bond is water than H-O bond due to the bigger size of S-atom.

D. S-atoms has less affinity for hydrogen atom than O-atom has for it.

Answer: C

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21. Para and ortho H_2 differ in

A. atomic number

B. atomic mass

C. spins of protons

D. number of neutrons

Answer: C

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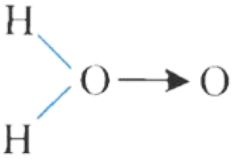
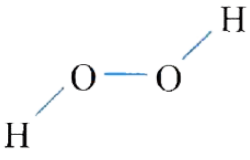
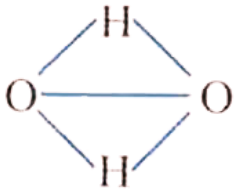
22. What is the structure of H_2O_2?

A. 

B. H-O-O-H

C. 

D. 

Answer: C

View Text Solution

23. Which of the following is responsible for the permanent hardness of water?

A. Calcium bicarbonate

B. Sodium chloride

C. Magnesium bicarbonate

D. Calcium sulphate

Answer: D

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24. Semi - water gas is a mixture of

A. $Ca + H_2$

B. $CO + N_2$

C. $CO + H_2 + N_2$

D. $H_2 + CH_4$

Answer: C

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25. Permanent hardness of water can be removed by adding

A. Na_2CO_3

B. K

C. Ca(OCl)Cl

D. Cl_2

Answer: A

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26. The degree of hardness of water is usually expressed in terms of

A. ppm by weight of $MgSO_4$

B. g/L of $CaCO_3$ and $MgCO_3$ present

C. ppm by weight of $CaCO_3$ irrespective of whether it is actually present.

D. ppm of $CaCO_3$ actually present in water.

Answer: C

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27. The permanent hardness of water is due to the presence of

A. bicarbonates of sodium and potassium.

B. chlorides and sulphates of sodium and potassium

C. chlorides and sulphates of calcium and magnesium.

D. phosphates of sodium and potassium

Answer: C

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28. Hydrogen is prepared from H_2O by adding

A. Ca, which act as reducing agent.

B. Al, which acts as oxidising agent.

C. Ag, which acts as reducing agent.

D. Au, which acts as oxidising agent.

Answer: A

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29. Antiseptics and disinfectants either kill or prevent growth of microorganism. Identify which of the following statements is not true :

A. Chlorine and Iodine are used as strong disinfectants

B. Dilute solutions of Boric acid and Hydrogen Peroxide are strong antiseptics.

C. Disinfectants harm the living tissues.

D. A 0.2% solution of phenol is an antiseptic while 1% solution acts as a disinfectant.

Answer: B

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30. (a) $H_2O_2 + O_3 \rightarrow H_2O + 2O_2$

(b) $H_2O_2 + Ag_2O \rightarrow 2Ag + H_2O + O_2$

Role of hydrogen peroxide in the above reactions is respectively

A. Oxidizing in (a) and (b)

B. Oxidizing in (a) annd reducing in (b)

C. reducing in (a) and oxidizing in (b)

D. reducing in (a) and (b)

Answer: D

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31. H_2O_2 cannot oxidise:

A. Na_2SO_4

B. KI

C. PbS

D. O_3

Answer: C

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32. Which of the following statements about hydrogen is incorrect ?

A. hydrogen has 3 isotopes of which protium is the most commen

B. hydrogen never acts as cation in ionic salts

C. hydrogen ion, H_3O^+ exits freely in solution

D. dihydrogen does not acts as a reducing agent

Answer: D

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Level 4

1. Hydrogen resembles halogens in many respects for which several factors are responsible. Of the following factors which one is most important in this respect ?

A. It tendency to lose an electron to form a cation

B. Its tendency to gain a single electron in its valence shell to attain stable configuration

C. Its low negative electron gain enthalpy

D. Its small size

Answer: B

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2. Why does H^+ ion always get associated with atoms or molecules ?

A. Ionisation enthalpy of hydrogen resembles that of alkali metals

B. Its reactively is similar to halogens

C. It resembles both alkali metals and halogens

D. Due to very small size it cannot exist free

Answer: D

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3. When zeolite which is hydrated sodium aluminium silicate is treated with hard water, the sodium ions are exchanged with:

A. Ca^{2+} ions

B. Mg^{2+} ions

C. both Ca^{2+} and Mg^{2+} ions

D. SO_4^{2-} and chloride ions

Answer: C

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4. Which of the following hydrides is electron-precise hydride ?

A. B_2H_6

B. NH_3

C. H_2O

D. CH_4

Answer: D

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5. Elements of which of the following group(s) of periodic table do not form hydrides?

A. Group 7, 8 and 9

B. Group 13

C. Group 15, 16 and 17

D. Group 14

Answer: A

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6. Only one element of â€¦â€¦.from hydride.

A. group 6

B. group 7

C. group 8

D. group 9

Answer: A

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7. Metal hydrides are ionic, covalent or molecular in nature. Among LiH, NaH, KH, RbH, CsH the correct order of increasing ionic character is

A. $LiH < NaH < CsH < KH < RbH$

B. $LiH < NaH < KH < RbH < CsH$

C. $RbH < CaH < NaH < KH < LiH$

D. $NaH < CsH < RbH < LiH < KH$

Answer: B

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8. Which of the following statements is incorrect?

A. Metallic hydrides are deficient of hydrogen

B. Metallic hydrides conduct heat and electricity

C. Ionic hydrides give hydrogen with water

D. Ionic hydrides are good conductors of electricity in solid state

Answer: D

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9. The oxide that give H_2O_2 on treatment with dilute H_2SO_4 is

A. PbO_2

B. $BaO_2, 8H_2O$

C. MnO_2

D. TiO_2

Answer: B

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10. Hydrogen peroxide is obtained by the electrolysis of

â€¦â€¦â€¦

A. water

B. hydrochloric acid

C. fused sodium peroxide

D. sulphuric acid

Answer: D

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11. Which of the following equations depict theoxidising nature of H_2O_2 ?

A.

$$2MnO_4^- + 6H^+ + 5H_2O_2 \rightarrow 2Mn^{2+} + 8H_2O + 5O_2$$

B. $2Fe^{3+} + 2H^{+} + 2H_2O_2 \rightarrow 2Fe^{2+} + 2H_2O + O_2$

C. $2I^{-} + 2H^{+} + H_2O_2 \rightarrow I_2 + 2H_2O$

D. $KIO_4 + H_2O_2 \rightarrow KIO_3 + H_2O + O_2$

Answer: C

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12. Which of the following equation depicts reducing nature of H_2O_2?

A. $2\left[Fe(CN)_6\right]^{4-} + 2H^{+} + H_2O_2$

$\rightarrow 2\left[Fe(CN)_{60}\right]^{3-} + 2H_2$

B. $I_2 + H_2O_2 + 2OH^{-} \rightarrow 2I^{-} + 2H_2O + O_2$

C. $Mn^{2+} + H_2O_2 \rightarrow Mn^{4+} + 2OH^-$

D. $PbS + 4H_2O_2 \rightarrow PbSO_4 + 4H_2O$

Answer: B

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13. Cosider the reactions

(i) $H_2O_2 + 2HI \rightarrow I_2 + 2H_2O$

(ii) $HOCl + H_2O_2 \rightarrow H_3O^+ + Cl^- + O_2$

Which of the following statements is correct about H_2O_2 with reference to these reactions ? Hydrogen peroxide is â€¦â€¦â€¦

A. an oxidising agent in both [A] and [B]

B. an oxidising agent in [A] and a reducing agent in [B]

C. an oxidising agent in [A] and an oxidising agent in [B]

D. a reducing agent both [A] and [B]

Answer: B

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14. Which of the following reaction produce dihydrogen from synthesis gas?

A. $CH_4(g) + H_2O(g) \xrightarrow[Ni]{1270K} CO(g) + 3H_2(g)$

B. $C(s) + H_2O(g) \xrightarrow{1270K} CO(g) + H_2(g)$

C. $CO(g) + H_2O(g) \xrightarrow[\text{Cat}]{673K} CO_2(g) + H_2(g)$

D. $C_2H_6 + 2H_2O \xrightarrow[Ni]{1270K} 2CO + 5H_2$

Answer: C

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15. When sodium peroxide is treated with dilute H_2SO_4, we get

A. sodium sulphate and water

B. sodium sulphate and oxygen

C. sodium sulphate, hydrogen peroxide, oxygen

D. sodium sulphate and hydrogen peroxide

Answer: D

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16. Which of the following compounds is used to remove water hardens

A. $Ca_3(PO_4)_2$

B. Na_3PO_4

C. $Na_6P_6O_{18}$

D. Na_2HPO_4

Answer: C

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17. When zeolite which is hydrated sodium aluminium silicate is treated with hard water, the sodium ions are exchanged with

A. Ca^{2+} ions

B. Mg^{2+} ions

C. both Ca^{2+} and Mg^{2+} ions

D. SO_4^{2-} and chloride ions

Answer: C

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18. In which of the following reactions does hydrogen acts as an oxidisng agent?

A. $H_2 + Na \rightarrow$

B. $CH_2 = CH_2 + H_2 \rightarrow$

C. $PbO_2 + H_2$

D. $F_2 + H_2 \rightarrow$

Answer: A

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19. $CO + H_2 \xrightarrow[\text{catalyst}]{300^\circ / 300atm} CH_3OH$ the catalyst is

A. Fe

B. Cr_2O_3 / ZnO

C. V_2O_5

D. Al_2O_3

Answer: B

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20. Which one of the following statements regarding H_2O_2 is false?

A. It is more stable in a basic solution

B. It is decomposed by MnO_2

C. It is a strong oxidising as well as reducing agent in acidic as well as in basic medium

D. It behaves as a weak acid

Answer: A

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21. H_2O_2 is a

A. monobasic acid

B. dibasic acid

C. neutral compound

D. weak alkali

Answer: B

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