CHEMISTRY

BOOKS - SURA CHEMISTRY (TAMIL ENGLISH)

HYDROGEN

Evalution Choose The Best Answer

1. Which of the following statements about hydrogen 1 is incorrect ?

A. Hydrogen ion H_3O^+ exists freely in solution.

B. Dihydrogen acts as a reducing agent.

C. Hydrogen has three isotopes of which tritium is the most common.

D. Hydrogen never acts as cation in ionic salts.

Answer: C

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2. Water gas is :

A. $H_2O(g)$

B. $CO + H_2O$

C. $CO + H_2$

D. $CO + N_2$

Answer: C

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

A. They are nuclear spin isomers

B. Ortho isomer has zero nuclear spin whereas the para isomer has one nuclear spin

C. The para isomer is favoured at low temperatures

D. The thermal conductivity of the para isomer is 50% greater than that of the ortho isomer.

Answer: B

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4. Ionic hydrides are formed by

A. halogen

B. chalcogens

C. inert gases

D. group one elements

Answer: D

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5. Tritium nucleus contains

A. 1p+0n

B. 2p+1n

C. 1p+2n

D. none of these

Answer: C

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6. Non-stoichiometric hydrides are formed by

A. palladium, vanadium

B. carbon, nickel

C. maganese, lithium

D. nitrogen, chlorine

Answer: A

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7. Assertion : Permanent hardness of water is removed by treatment with washing soda

Reason : Washing soda reacts with soluble calcium and magnesium chlorides and sulphates in hard water to form insoluble carbonates

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true but reason is false

D. Both Assertion and reason are false

Answer: A

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8. If a body of a fish contains 1.2 g hydrogen in its total body mass, if all the hydrogen is replaced with deuterium then the increase in body weight of the fish will be

A. 1.2g

B. 2.4g

C. 3.6g

D. $\sqrt{4.8g}$

Answer: A

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9. The hardness of water can be determined by volumetrically using the reagent

A. sodium thio sulphate

B. potassium permanganate

C. hydrogen peroxide

D. EDTA

Answer: D

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10. The cause of permanent hardness of water is due to

A. $Ca(HCO_3)_2$

B. $Mg(HCO_3)_2$

C. $CaCl_2$

D. $MgCO_3$

Answer: C

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11. Zeolite used to soften hardness of water is, hydrated

A. Sodium aluminium silicate

B. Calcium aluminium silicate

C. Zinc aluminium borate

D. Lithium aluminium hydride

Answer: A

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12. A commercial sample of hydrogen peroxide marked as 100 volume H_2O_2, it means that.

A. 1 ml of H_2O will give 100 ml O_2 at STP

B. 1 L of H_2O will give 100 ml O_2 at STP

C. 1 L of H_2O will give 22.4 L O_2

D. 1 ml of H_2O_2 will give 1 mole of O_2 at STP

Answer: A

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13. When hydrogen peroxide is shaken with an acidified solution of potassium dichromate in presence of ether, the ethereal layer turns blue due to the formation of

A. Cr_2O_3

B. CrO_4^{2-}

C. $CrO(O_2)_2$

D. none of these

Answer: C

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14. For decolourisation of 1 molle of acidified $KMnO_4$ the moles of H_2O_2 required is

A. $\frac{1}{2}$

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

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

D. $\frac{7}{2}$

Answer: C

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15. Volume strength of 1.5 N H_2O_2 is

A. 1.5

B. 4.5

C. 16.8

D. 8.4

Answer: D

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16. The hybridisation of oxygen atom is H_2O and H_2O_2 are, respectively

A. sp and `sp^3

B. `sp and sp

C. sp and sp^2

D. sp^3 and sp^3

Answer: D

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17. The reaction

$$H_3PO_2 + D_2O \rightarrow H_2DPO_2 + HDO$$

indicates that hypo-phosphorus acid is

A. tribasic acid

B. dibasic acid

C. mono basic acid

D. none of these

Answer: C

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18. In solid ice, oxygen atom is surrounded

A. tetrahedrally by 4 hydrogen atoms

B. octahedrally by 2 oxygen and 4 hydrogen atoms

C. tetrahedrally by 2 hydrogen and 2 oxygen atoms

D. octahedrally by 6 hydrogen atoms

Answer: A

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19. The type of H-bonding present in ortho nitro phenol and p-nitro phenol are respectively

A. inter molecular H-bonding and intra molecular H-bonding

B. intra molecular H-bonding and inter molecular H-bonding

C. intra molecular H - bonding and no H - bonding

D. intra molecular H - bonding and intra molecular H - bonding

Answer: B

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20. Heavy water is used as

A. moderator in nuclear reactions

B. coolant in nuclear reactions

C. both (a) and (b)

D. none of these

Answer: C

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21. Water is a

A. basic oxide

B. acidic oxide

C. amphoteric acid

D. none of these

Answer: C

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Write Brief Answer To The Following Questions

1. Explain why hydrogen is not placed with the halogen in the periodic table.

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2. Discuss the three types of Covalent hydrides

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3. Predict which of the following hydrides is a gas on a solid (a) HCI (b) NaH. Give your reason.

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4. Write the expected formulas for the hydrides of 4^{th} period elements.What is the trend in the formulas? In what way the first two numbers of the series different from the others ?

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5. Write chemical equation for the following reactions.

Reaction of hydrogen with tungsten (VI) oxide on heating.

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6. Write chemical equation for the following reactions.

Hydrogen gas and chlorine gas.

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7. Complete the following chemical reactions and classify them in to (a) hydrolysis (b) redox (c) hydration reactions.

$CaO + H_2O \rightarrow$

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8. Complete the following chemical reactions and classify them in to (a) hydrolysis (b) redox (c) hydration reactions.

$CrCl_3 + H_2O \rightarrow$

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9. Complete the following chemical reactions and classify them in to (a) hydrolysis (b) redox (c) hydration reactions.

$CaO + H_2O \rightarrow$

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10. Hydrogen peroxide can function as an oxidising agent as well as reducing agent.

substantiate this statement with suitable examples.

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11. Do you think that heavy water can be used for drinking purposes ?

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12. What is water-gas shift reaction?

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13. Justify the position of hydrogen in the periodic table?

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14. What are isotopes? Write the names of isotopes of hydrogen.

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15. Mention the uses of heavy water .

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16. Explain the exchange reactions of deuterium

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17. How do you convert para hydrogen into ortho hydrogen ?

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18. Mention the uses of deuterium.

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19. Explain preparation of hydrogen using electrolysis.

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20. A groups metal (A) which is present in common salt reacts with (B) to give compound in which hydrogen is present in -1 oxidation state. (B) on reaction with a gas (C) to i universal solvent (D). The compound (D) on reacts with (A) to give (E), a strong base Identify A, B, C, D and E. Explain the reactions.

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21. NH_3 has exceptionally high melting point and boiling point as compared to those of the hydrides of the remaining element of group 15. Explain.

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22. Why interstitial hydrides have a lower density than the parent metal.

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23. Compare the structures of H_2O and H_2O_2

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24. How do you expect the metallic hydrides to be useful for hydrogen storage?

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25. Arrange NH_3, H_2O and HF in the order of increasing magnitude of hydrogen bonding

and explain the basis for your arrangement.

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Additional Question Additional Choose The Correct Answer

1. Ionic hydrides are formed by

A. halogen

B. chalcogens

C. alkalimetals

D. inert gases

Answer: C

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2. Volume stength of $0.5N$, H_2O_2 is

A. 2.8

B. 8.4

C. 5.6

D. 16.8

Answer: A

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3. The most abund ant element in the universe is _____

A. aluminium

B. mica dihydrogen

C. nitrogen

D. deuterium

Answer: C

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4. The number of neutrons is hydrogen atom is _____

A. three

B. two

C. one

D. zero

Answer: D

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5. _____ is known as heavy hydrogen.

A. protium

B. deuterium

C. tritium

D. both a and b

Answer: B

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6. The radio acti ve isotope used in illumination of wrist watches instead of radium is_____

A. ${}_{1}T^{3}$

B. ${}_{1}D^{2}$

C. ${}_{10}Ne^{21}$

D. ${}_{2}He^{3}$

Answer: A

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7. Deuterium consists of _____

A. one electron, two proton, three neutron

B. one electron, one proton, one neutron

C. two electron, one proton, one neutron

D. three electron, two proton, one neutron

Answer: B

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8. The radioactive isotope of hydrogen is _____

A. protium

B. deuterium

C. tritium

D. nascent hydrogen

Answer: C

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9. The half life period of tritium is _____

A. 12.33 secs

B. 12.33 mins

C. 12.33 hrs

D. 12.33 years

Answer: D

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10. Ammonia is manufactured by ____ process.

A. Contact

B. Bergius

C. Haber's

D. none of the above

Answer: C

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11. _____ torches is / are used in cutting and welding of a steel.

A. Oxy acetylene

B. Oxy hydrogen

C. both a and b

D. neither a nor b

Answer: C

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12. Hydrogen is used in _____

A. Hydrogenation of oils

B. fuel cells

C. gas bags for air ships

D. all of the above

Answer: D

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13. Which among the following statement/s given below is/ are incorrect regarding hydrogen?

1) It is diatomic in nature.

2) Has only one electron in the outermost shell

3) Very good oxidizing agent

4) Does not form hydrides easily

A. 1,2,& 3

B. only 4

C. only 3

D. only 2

Answer: C

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14. The conversion of atomic hydrogen to dihydrogen is a _____ change.

A. endothermic

B. exothermic

C. photochemical

D. nuclear

Answer: B

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15. $CO_{(g)} + H_2O_{(g)} \xrightarrow[X]{400C} CO_{2(g)} + H_{2(g)}$

'X' is _____

A. Nickel

B. Iron

C. Iron oxide

D. Vanadium penta oxide

Answer: C

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16. Hydrogen bomb is based on the principle of _____

A. fission

B. fusion

C. both a and b

D. neither a nor b

Answer: C

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17. Hydrogen can be obtained from water by reaction with

A. metal oxides

B. non metal oxides

C. metals

D. metal hydrides

Answer: C

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18. Hydrogen burns in air with a _____flame.

A. light bluish

B. yellow

C. green

D. none of these

Answer: B

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19. Which pair are not hydrogen isotopes?

A. Ortho and para hydrogen

B. Protium and deuterium

C. Deuterium and tritium

D. Tritium and protium

Answer: A

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20. Ortho and para hydrogen differ in

A. proton spin

B. electron spin

C. nuclear charge

D. both b and c

Answer: A

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21. _____ is considered as the potential alternative fuel of the future.

A. hydrogen

B. gasoline

C. biodiesel

D. propane

Answer: A

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22. The ionisation energy of hydrogen is higher than alkali metals. Pick out the correct reason for the above statement.

A. Because of smaller size of H.

B. Presence of $\leq^{-}$ in outermost shell.

C. Presence of one proton in its nucleus.

D. Absence of neutrons.

Answer: A

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23. Hydogen accepts an electron to attain the inert gas configuration. In this way it resembles _____

A. chalcogens

B. halogens

C. transition metals

D. alkali metals

Answer: B

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24. Hydrogen acts as a reducing agent and thus resembles

A. halogens

B. chalogens

C. inert gases

D. alkali metals

Answer: D

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25. $FeSO_4$ contains_____ molecules of water of hydration.

A. 5

B. 7

C. 10

D. 12

Answer: B

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26. Which among of the following reaction produces hydrogen ?

A. $Na_2O_2 + HCl$

B. $BaO_2 + HCl$

C. $K_2S_2O_8 + H_2O$

D. $Zn + HCl$

Answer: D

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27. In which of the following compounds does hydrogen has an oxidation state of -1?

A. CH_4

B. NH_3

C. HCl

D. CaH_2

Answer: D

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28. Assertion : Hydrogen is the simplest atom

Reason : Its nucleus contains only two protons

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true but reason is false

D. Both Assertion and reason are false

Answer: C

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29. Assertion : H^+ ion has a very low polarising power.

Reason : Size of H^+ ion is very large

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true but reason is false

D. Both Assertion and reason are false

Answer: D

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30. Assertion : Hydrogen resembles halogens.

Reason : It has high ionisation energy but still form H^+ ion.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true but reason is false

D. Both Assertion and reason are false

Answer: B

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31. Which properties of hydrogen are responsible for moderation of the climate and body temperature of living beings?

A. High heat of vapourisation

B. High heat capacity

C. both (a) and (b)

D. None of these

Answer: C

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32. Consider the following statements

1) Water has high dielectric constant.

2) Water has strong intra molecular hydrogen bonding

3) Water is an Universal solvent which of the

following statement (s) given above is/are not correct

A. 1 & 3

B. only 1

C. 2 & 3

D. only 2

Answer: D

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33. consider the following statements

1) Hard water forms scum with soap.

2) Hard water lathers easily with soap

3) Hard water is unsuitable for laundry and boilers which of the following statement (s) given above is/are correct ?

A. 1 & 2

B. only 1

C. 1 & 3

D. only 2

Answer: A

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34. Hardness of water is due to _____ of calcium and magnesium

A. bicarbonates

B. sulphates

C. chloride

D. all the above

Answer: D

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35. Which of the following compounds is used for water softening ?

A. $Ca_3(PO_4)_2$

B. Na_3PO_4

C. $NaAlSiO_4$

D. Na_2HPO_4

Answer: C

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36. The structure of water molecule is _____

A. bent

B. tetrahedral

C. distorted octahedral

D. trigonal bi pyramidal

Answer: A

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37. _____ is extensively used as a moderator in nuclear reactors.

A. H_2O

B. H_2O_2

C. D_2O

D. D_2O_2

Answer: C

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38. The H-O-H angle in water molecules is about

A. 90°

B. 104.5°

C. $109^\circ 28'$

D. 180°

Answer: B

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39. Hardness of water cannot be removed by

A. Treatment with washing soda

B. adding calgon

C. boiling

D. addition of chlorine

Answer: D

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40. The chemical that is added to water in order to remove temporary hardness is _____

A. $Ca(OH)_2$

B. $CaCO_3$

C. HCl

D. $CaSO_4$

Answer: A

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41. Name the anions responsible for permanent hardness of water

A. sulphite

B. chloride

C. nitrate

D. both (a) and (b)

Answer: B

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42. Presence of which cation makes the water hard in nature?

A. Ca & Mg

B. Na & Mg

C. Ca & Na

D. Mg & F

Answer: A

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43. Heavy water is _____

A. De-mineralilzed water

B. De-ionized water

C. ordinary water containing dissolved salts of heavy metals.

D. The compound of heavier isotope of hydrogen with oxygen.

Answer: D

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44. The velocity of neutrons in nuclear reactor is slowed down by

A. H_2O

B. D_2O

C. Zinc rods

D. Copper rods

Answer: B

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45. The maximum density of water is observed at _____

A. $0^\circ C$

B. $4^\circ C$

C. $11.6^\circ C$

D. $273^\circ C$

Answer: B

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46. Assertion : Alcohols and carbohydrates are soluble in water

Reason : Water is non-polar solvent.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true but reason is false

D. Both Assertion and reason are false

Answer: B

47. Hydrogne peroxide was discovered by _____

A. Chadwick

B. J.J Thomson

C. Urey

D. J.L. Thenard

Answer: D

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48. Metal hydrides are ionic, covalent or molecular in nature. Among LiH, NaH, KH, RBH, CSH, the correct order of increasing ionic character is .....

A. LiHgtNaHgtCsHgtKHgtRbH

B. LiHltNaHltKHltRbHltCsH

C. RbHgtCsHgtNaHgtKHgtLiH

D. NaHgtCsHgtRbHgtLiHgtKH

Answer: B

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49. H_2O_2 acts a _____ agent.

A. oxidizing

B. reducing

C. both reducing and oxidizing

D. neither reducing nor oxidizing

Answer: C

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50. H_2O_2 is a _____ acid.

A. mono basic

B. di basic

C. tri basic

D. none

Answer: B

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51. LiH is an example of _____ hydride.

A. ionic

B. saline

C. covalent

D. both a and b

Answer: D

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52. A examples of covalent hydride is _____

A. CaH_2

B. CH_4

C. TiH

D. all the above

Answer: B

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53. _____ is an example of intra molecular hydrogen bonding.

A. salicylaldehyde

B. hydrogen fluoride

C. para nitro phenol

D. both a and c

Answer: A

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54. HF has _____ hydrogen bond.

A. intramolecular

B. intermolecular

C. intrastellar

D. interstellar

Answer: B

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55. Acetic acid exist as a _____

A. monomer

B. dimer

C. trimer

D. octamer

Answer: B

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56. What is the dihedral angle of H_2O_2 in gas and solid phase ?

A. 111.5° and 90.2°

B. 115.1° and 92°

C. 92° and 115.1°

D. 90.2° and 111.5°

Answer: A

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57. H_2O_2 acts as

A. oxidising agent

B. reducing agent

C. bleaching agent

D. all of these

Answer: D

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58. The reaction $H_2O_2 \rightarrow H_2O + O_2$ represents,

A. Oxidising of H_2O_2

B. reducing of H_2O

C. dispropornation of oxygen

D. acidic nature of H_2O_2

Answer: C

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59. H_2O and H_2O_2 resemble in

A. Bond angle

B. Hybridization of oxygen

C. structure

D. Oxidation state of oxygen

Answer: B

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60. Statement I : The O-O bond length in H_2O_2 is shorter than that of O_2F_2

Statement II : H_2O_2 is an ionic compound.

A. Both statement I and II are true but statement II explains statement I

B. Both statement I and II are true but statement II does not explains statement I

C. Statement I is true but statement II is false.

D. Both the statements are false.

Answer: D

61. Ionic hydrides are usallly

A. Good conductors of electicity in solid state

B. volatile

C. non-crystalline

D. stoichiometic compounds

Answer: D

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62. Intermolecular H-bonding is present in _____

A. HF

B. H_2O

C. C_2H_5OH

D. All of these

Answer: D

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63. Which one of the following bond is stronger ?

A. Covalent

B. H-bond

C. Vanderwaal's force

D. All of these

Answer: A

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64. The intramolecular hydrogen bonding in molecules lead to _____

A. high melting point

B. low boiling point

C. high boiling point

D. high solubility in water

Answer: B

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65. Assertion : Industrial method of preparation of H_2O_2 involves 2-ethylanthara quinol.

Reason : The process is cyclic.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true but reason is false

D. Both Assertion and reason are false

Answer: A

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66. Intramolecular H-bonding is present in_____

A. o-nitrophenol

B. salicylic acid

C. salicylaldlehyde

D. all of these

Answer: D

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67. Which of the following is incorrect?

A. Hydrogen forms unipositive ion like alkali metals

B. Hydrogen forms halides, oxides peroxides and sulphides like alkali metals

C. Hydrogen also acts as a reducing agent

D. Hydrogen has ionization energy ranging of alkali metals.

Answer: D

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68. Which is the only isotope that does not contain a neutron?

A. Protium

B. Dutrium

C. Tritium

D. Chlorin-35

Answer: A

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69. The equilibrium shifts in favour of para hydrogen when the temperature is

A. highered

B. lowered

C. increased

D. a & c

Answer: B

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70. Ortho hydrogen has magnetic moment_____ that of a proton.

A. twice

B. three times

C. four times

D. six times

Answer: A

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71. Which explosive reaction is used in fuel cells to generate electricity?

A. Reaction of hydrogen with carbon

B. Reaction of hydrogen with oxygen

C. Reactoin of carbon with oxygen

D. Reactoin of carbon with nitrogen

Answer: B

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72. What is responsible for the high melting and boiling points of water?

A. Hydrogen bonding

B. Strong forces

C. High reactivity

D. b & c

Answer: A

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73. In another way to soften the hard water is by using a process called _____

A. Ion-exchange

B. Osmosis

C. Reverse Osmosis

D. Ionic Pressure

Answer: A

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74. The exchange reactions are useful in determining the number of ___ present in a given compound

A. Hyrogen atoms

B. Ionic hydrogens

C. Oxygen atoms

D. Ionic oxygens

Answer: B

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75. On an industrial scale, hydrogen peroxide is prepared exclusive by autoxidation of _____

A. 2-alkylanthraquinol

B. 2-quinol

C. 2-anthra quinol

D. 2-alkyl quinol

Answer: A

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76. _____ density of ice compared with water at $0^\circ C$

A. higher

B. lower

C. retained

D. more

Answer: B

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Additional Short Answer

1. What is meant by intramolecular hydrogen bond? Give one example

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2. Name the isotopes of hydrogen.

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3. What is ortho hydrogen?

 Watch Video Solution

4. What is para hydrogen?

 Watch Video Solution

5. How does iron react with steam ?

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6. Write short notes on Deuterium

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7. Which is the radio active isotope of Hydrogen? Write a note on it.

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8. Give two uses of Tritium.

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9. Explain the large scale production of Hydrogen.

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10. Write a note on Haber's process.

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11. What is hydrogenation? What is its industrial application?

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12. Complete the following reactions and balance them:

$CO_{(g)} + H_{2(g)} \rightarrow$

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13. Complete the following reactions and balance them:

$$CH_{4(g)} \xrightarrow[Ni]{1270k}$$

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14. How is deuterium prepared from heavy water ?

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15. Give one example of a reaction in which dihydrogen acts as:

an oxidising agent

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16. Give one example of a reaction in which dihydrogen acts as:

a reducing agent

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17. Explain the laboratory preparation of dihydrogen.

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18. At room temperature, Hydrogen reacts very Slowly. Explain (HOTS)

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19. Expl ain the consequences of high enthalpy of H-H bond in terms of chemical reactivity of dihydrogen.

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20. Calcium Hydroxide cannot be used to remove permanent hardness of water why?

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21. How will you classify water based on the spin of the nuclei of the hydrogen atoms ?

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22. Explain the reaction of water with metals of Group I.

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23. Explain the reaction of water with halogens.

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24. What is Heavy water ?

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25. What is Zeolite ?

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26. Water is an amphoteric oxide. Justify this statement.

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27. What causes hardness in water ?

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28. Ice floats on water. Give reason

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29. Why is water molecule polar?

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30. What are the types of hydrogen bonding?

Give example.

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31. Give any two methods of preparation of H_2O_2.

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32. Distinguish between

hard water and soft water

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33. Distinguish between Temporary hardness and permannent hardness.

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34. What is meant by binary hydride? Give example.

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35. What is hydrogen bonding?

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36. List out the various types of hydrides formed, when dihydrogen reacts with s-block, p-block, d-block and f-block elements.

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37. Statues coated with white lead turn black on exposure to air Its original colour is restored on treatment with H_2O_2. Explain.

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38. What are ternary hydrides? Give example?

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39. Write short notes on Ionic Hydrides and give suitable examples.

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40. Explain covalent hydrides. How are they classified. Give examples.

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41. Write short notes on Metallic Hydrides.

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42. Identify the following as covalent, ionic or interstitial hydrides

$CaH_2, LaH_2, TiH_2, NaH, GeH_2, NH_3$

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43. How do metallic hydrides differ from molecular hydrides?

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44. What do you mean by hydride gap ?

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45. Write down the possible applications of H_2O_2 on the basis of its oxidising property.

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46. What is the nuclear reaction that take place in the sun and other stars?

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47. Why hydrogen gas is used as fuel?

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48. H_2O_2 is always stored in plastic bottles ? Why ?

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49. Why H_2O_2 is used as mild antiseptic?

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50. Why metallic hydrides are called interstitial hydrides? Give one example.

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51. Write a note about gas hydrates.

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52. Give the advantage of future fuel-hydrogen.

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53. How does H_2O_2 behave as bleaching agent?

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54. Draw the structure of

Acetic acid

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55. Draw the structure of

Water

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56. What do you understand by the term 'non stoichiometric hydrides? Do you expect this type f hydrides to be formed by alkali metals? Justify your answer,

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57. Explain the action of soap with hard water.

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58. Write a note about saline (or) ionic hydride.

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59. What are intra molecular hydrogen bonding? Explain with an example.

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60. What are Clathrate hydrate? Explain it with suitable example.

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61. What are intermolecular hydrogen bonds? Explain with example.

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62. What is the difference between the terms 'hydrolysis' and 'hydration'? .

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63. Why hydrogen behaves both as a halogen and as an alkali metal ?

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64. Conc. H_2SO_4 annot be used for drying hydrogen gas. Why?

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65. Write a note on application of hydrogen in cutting and welding purpose.

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66. Why does hydrogen occur in a diatomic form rather than in a monoatomic form under normal conditions?

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67. Describe the industrial applications of hydrogen dependent on : a. the heat liberated when its atoms are made to combine on the surface of a metal.

b. its effect on unsaturated organic system in

presence of a catalyst.

c. its ability to combine with nitrogen under specific conditions.

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68. Illustrate the industrial applications of hydrogen , depending on

Its ability to combine with nitrogen under specific conditions.

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69. Illustrate the industrial applications of hydrogen , depending on

Its ability to combine with nitrogen under specific conditions.

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70. List out the uses of hydrogen.

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71. Explain the exchange reactions of deuterium

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72. Bond angle of water is reduced from 109.28° ot 104.5°.Explain.

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73. How does heavy water react with the following compounds?

Al_4C_3

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74. How does heavy water react with the following compounds?

CaC_2

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75. How does heavy water react with the following compounds?

Mg_3N_2

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76. How does heavy water react with the following compounds?

Ca_3P_2

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77. Compare the structures of ice & water.

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78. Can marine species live in distilled water?

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79. Can distilled water be called as deionised water?

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80. Mention any two biological effects of D_2O

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81. Name the salts that lead to the formation of permanent hardness in water can you remove permanent hardness by boiling?

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82. How will you regenerate zeolite in ion-exchange method?

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83. What kind of compounds can be dissolved and hydrolysed in water?

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84. Water is a useful solvent. Which properties make water as a good solvent?

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85. List out the properties th at allow water to play a key role in the biosphere

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86. How does the hard water affect the boilers?

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87. Soap forms lather with soft water but does not form lather with hard water. Why?

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88. Why hard water is not suitable for laundry?

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89. Identify the nature of hydrides that are formed by the elements of atomic numbers 15, 19, 23, 44 with dihydrogen. Compare their reactivity towards water.

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90. How are reducing agents in synthetic organic chemistry prepared?

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91. What are the advantages of using hydrogen as fuel?

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92. Explain about Hydrogen sponge.

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93. How is hydrogen peroxide prepared on industrial scale?

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94. How is hydrogen peroxide is used to restore the white colour of old paintings.

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95. How is tritium prepared?

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96. Difference between ortho and para hydrogen.

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Numerical Problem

1. An element (A) belonging to group number 1 and period number 3 react with dihydrogen to

form an hydride (B). The element (A) reacts with the universal solvent to give a strong base (C). Identify A, Band C.

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2. Identify the compound (A) which is a universal solvent. Compound A reacts with chlorine gas to give B and C. Compound A dissolves in an ionic compound of silicon to give compound D. Identify A and write the

equations involved in the formation of B, C and D.

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