CHEMISTRY

BOOKS - DISHA CHEMISTRY (HINGLISH)

HYDROGEN

Mcqs

1. Which of the following will not displace hydrogen

A. Ba

B. Pb

C. Hg

D. Sn

Answer: C

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2. Which of the following statements is correct ?

A. Hydrogen has same IP as alkali metals

B. Hydrogen has same electronegativity as halogens

C. It has oxidation number of -I and+ I

D. It will not be liberated at anode.

Answer: C

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3. Which one of the following pairs of substances on reaction will not evolve H_2 g gas?

A. Iron and H_2SO_4(aq)

B. Iron and steam

C. Copper and HCl(aq)

D. Sodium and ethanol

Answer: C

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4. Following are some properties of hydrogen. Which of the following properties resemble with alkali metals and which with halogens

(i) Hydrogen lose one electron to form tmipositive ions (ii) Hydrogen gain one electron to form uninegative ions (iii) Hydrogen forms oxides, halides and sulphides (iv) Hydrogen has a very high ionization enthalpy (v) Hydrogen forms a diatomic molecule, combines with elements to form hydrides and covalent compounds.

A. Alkali metals resemble (i), (iii) and (iv) Halogens resemble (ii) and (v)

B. Alkali metals resemble (i) and (iii) Halogens resemble (ii), (iii) and (v)

C. Alkali metals resemble (i) and (iii) Halogens resemble (ii), (iv) and (v)

D. Alkali metals resemble (i) only Halogens resemble (iv) and (v)

Answer: C

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5. The unusual properties of water in the condensed phase (liquid and solid states) are due to the

A. presence of hydrogen and covalent bonding between the water molecules

B. presence of covalent bonding between the water molecules

C. presence of extensive hydrogen bonding between water molecules

D. presence of ionic bonding

Answer: C

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6. Hydrogen bond energy is equal to :

A. 3-7 cals

B. 30-70 cals

C. 3-10 k cals

D. 30-70 kcals

Answer: C

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7. D_2O is preferred to H_2O, as a moderator, in nuclear reactors because

A. D_2O slows down fast neutrons better

B. D_2O has high specific heat

C. D_2O is cheaper

D. The neutron absorbing ability of D_2O is higher

Answer: D

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8. Consider the following statements :

1. Atomic hydrogen is obtained by passing hydrogen through an electric arc

2. Hydrogen gas will not reduce heated ahm1inium oxide.

3. Finely divided palladium adsorbs large volume of hydrogen gas

4. Pure nascent hydrogen is bewst obtained by reacting Na with C_2H_5OH

Which of the above statement is/are correct?

A. only 1

B. only 2

C. 1,2 and 3

D. 2,3 and 4

Answer: C

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9. The low density of ice compared to water is due to

A. hydrogen bonding interactions

B. dipole-dipole interactions

C. dipole-induced dipole interactions

D. induced dipole-induced dipole interactions

Answer: A

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10. What is formed when calcium carbide reacts with heavy water?

A. C_2D_2

B. CaD_2

C. Ca_2D_2O

D. CD_2

Answer: A

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11. Which of the following is formed on reaction of carbon monoxide gas with dihydrogen in presence of cobalt as a catalyst?

A. Methanal

B. Methanol

C. Methane

D. Formic acid

Answer: B

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12. Water possesses a high dielectric constant, therefore

A. it always contains ions

B. it is a universal solvent

C. can dissolve covalent compounds

D. can conduct electricity

Answer: B

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13. The m.p. of most of the solid substances increase with an increase of pressure . However ice melts at a

temperature lower than its usual melting point when pressure is increased. This is because

A. ice is less denser than H_2O

B. pressure generates heat

C. the chemical bonds break under pressuer

D. ice is not a true solid.

Answer: A

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14. In context with the industrial preparation of hydrogen from water gas $(CO + H_2)$, which of the following is the correct statement?

A. CO and H_2, are fractionally separated using differences in their densities

B. CO is removed by absorption in aqueous Cu_2Cl_2 solution

C. H_2 is removed through occlusion with Pd

D. CO is oxidised to CO_2 with steam in the presence of a catalyst followed by absorption of CO_2 in alkali

Answer: D

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15. Calculate the normality of 10 volume H_2O_2 ?

A. 1.7 N

B. 12 N

C. 30.3 N

D. 0.0303 N

Answer: A

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16. The hydride ion H^- is stronger base than its hydroxide ion OH^-. Which of the following reactions will occur if sodium hydride (NaH) is dissolved in water?

A. $H^-(aq) + H_2O \rightarrow H_3O^-$

B. $H^-(aq) + H_2O(l) \rightarrow OH^- + H_2O$

C. $H^- + H_2O \rightarrow$ No reaction

D. None of these

Answer: B

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17. Match the column

A. A-III,B-IV,C-II,D-I

B. A-II,B-I,C-III,D-IV

C. A-II,B-IV,C-III,D-I

D. A-III,B-I,C_II,D-IV

Answer: D

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18. When a substance A reacts with water it produces a combustible gas B and a solution of substance C in water. When another substance D reacts with this solution ofC, it also produces the same gas B on warming but D can produce gas B on reaction with dilute sulphuric acid at room temperature. A imparts a deep golden yellow colour to a smokeless flame of Bunsen burner. A, B, C and D respectively are

A. $Na, H_2, NaOH, Zn$

B. K, H_2, KOH, Al

C. $Ca, H_2, Ca(OH)_2, Sn$

D. $CaC_2, C_2H_2, Ca(OH)_2, Fe$

Answer: A

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19. At its melting point ice is lighter than water because

A. H_2O molecules are more closely packed in solid state

B. ice crystals have hollow hexagonal arrangement of H_2O molecules.

C. on melting of ice the H_2O molecules shrinks in size

D. ice froms mostly heavy water on first melting.

Answer: B

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20. H_2O_2 is commonly prepared in lab by the reaction of

A. $PbO_2 + H_2SO_4$

B. $MnO_2 + H_2SO_4$

C. $BaO_2 + H_2O + CO_2$

D. $Na_2O_2 + H_2O$

Answer: C

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21. Which of the following is formed by the action of water on sodium peroxide

A. H_2

B. N_2

C. O_2

D. CO_2

Answer: C

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22. The reaction, $2H_2O_2 \rightarrow 2H_2O + O_2$

shows that H_2O_2:

A. acts as reducing agent

B. acts as oxidising agent

C. is decomposed

D. None of these

Answer: C

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23. True peroxide is

A. BaO_2

B. MnO_2

C. PbO_2

D. NO_2

Answer: A

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24. The component present in greater proportion in water gas is

A. CH_4

B. CO_2

C. CO

D. H_2

Answer: D

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25. Which physical property of dihydrogen is wrong ?

A. Odourless gas

B. Tasteless gas

C. colourless gas

D. non-inflammable gas

Answer: D

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

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.

$$KNO_2(aq) + H_2O_2(aq) \rightarrow KNO_2(aq) + H_2O(l)$$

Answer: A

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27. In which of the following reactions, H_2O_2 is acting as a reducing agent

A. $H_2O_2 + SO_2 \rightarrow H_2SO_4$

B. $2KI + H_2O_2 \rightarrow 2KOH + I_2$

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

D. $Ag_2O + H_2O_2 \rightarrow 2Ag + H_2O + O_2$

Answer: D

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28. Commercial 10 volume H_2O_2 is a solution with a strength of approximately

A. 0.15

B. 0.03

C. 0.01

D. 0.1

Answer: B

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29. Which of the following is not true?

A. D_2O freezes at lower temperature than H_2O

B. reaction between H_2 and Cl_2 is much faster than D_2 and Cl_2

C. Ordinary water getws electrolysed more rapidly than D_2O

D. Bond dissociation energy of D_2 is greater than H_2.

Answer: A

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30. When zeolite (hydrated sodium aluminium silicate) is treated with hard water the sodium ions are exchanged with

A. H^+ ions

B. Ca^{2+} ions

C. SO_4^{2-} ions

D. OH^- ions

Answer: B

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31. The oxide that gives H_2O_2 on treatment with a dil. Acid is

A. Na_2O_2

B. PbO_2

C. TiO_2

D. MnO_2

Answer: A

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32. Which statement is wrong?

A. Ordinary hydrogen is an equilibrium mixture of ortho and para hydrogen

B. In ortho hydrogen spin oftwo nuclei is in same direction

C. Ortho and para forms do not resemble in their chemical properties

D. In para hydrogen spin of two nuclei is in opposite direction

Answer: C

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33. Water contracts on heating

A. to $100^\circ C$

B. from 0° to $4^\circ C$

C. to $273K$

D. from 10° C to 20° C

Answer: B

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34. Water is:

A. more polar than H_2S

B. more of less identical in polarity with H_2S

C. less polar than H_2S

D. None of these

Answer: A

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35. $LiAlH_4$ is used as

A. An oxidizing agent

B. A reducing agent

C. A mordant

D. A water softner

Answer: B

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36. Hydrogen is not obtained when Zn reacts with

A. cold water

B. dil H_2SO_4

C. dil. HCl

D. 20% NaOH

Answer: A

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37. An inorganic compound gives off O_2 when heated, turns an acidic solution of KI violet and reduces acidified $KMnO_4$ the compound is

A. SO_3

B. KNO_3

C. H_2O_2

D. all of these

Answer: C

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38. The species that does not contain peroxide ions

A. PbO_2

B. H_2O_2

C. SrO_2

D. BaO_2

Answer: A

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

A. $LiH > NaH > ScH > KH > RbH$

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

C. $RbH > CsH > NaH > KH > LiH$

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

Answer: B

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40. Which of the following in incorrect statement?

A. s-block elements,e xcept Be and Mg, form ionic hydride

B. $BeH_4, MgH_2, CuH_2, ZnH_{20}$, CaH_2 and HgH_2 are intermediate hydride

C. p-block elements form covalent hydride

D. d- and f-block elements form ionic hydride

Answer: D

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41. The decomposition of H_2O_2 is accelerated by-

A. glycerine

B. alcohol

C. phosphoric acid

D. Pt powder

Answer: D

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42. The molrity of a 100 ml solution containing 5.1 g of hydrogen peroxide is

A. 0.15 M

B. 1.5 M

C. 3.0 M

D. 50.0 M

Answer: B

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43. Permanent hardness of water can be removed by adding calgon $(NaPO_3)_n$. This is an example of

A. adsoption

B. exchange of ion

C. precipitation

D. none of these.

Answer: B

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44. The oxidation state of most electronegative element in the products of reaction BaO_2 with dil, H_2SO_4 are

A. 0 and -1

B. -1 and -2

C. -2 and 0

D. -2 and $+1$

Answer: B

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