Hydrogen

Q.1.Elements of which of the following group(s) of periodic table do not form hydrides.

a) Groups 7, 8, 9
b) Group 13
c) Groups 15, 16, 17
d) Group 14

Q.2. Commercial 10 volume H_2O_2 is a solution with a strength of approximately

a) 30%
b) 3%
c) 1%
d) 10%

Q.3. What is formed when calcium carbide reacts with heavy water?

a) C_2D_2
b) CaD_2
c) Ca_2D_2O
d) CD_2

Q.4. The correct order of the O–O bond length in O_2, H_2O_2 and O_3 is

a) $O_2 > O_3 > H_2O_2$
b) $O_3 > H_2O_2 > O_2$
c) $H_2O_2 > O_3 > O_2$
d) $O_2 > H_2O_2 > O_3$

Q.5. True peroxide is

a) MnO_2
b) BaO_2
c) PbO_2
d) NO_2

Q.6. Which statement is wrong?

a) Ordinary hydrogen is an equilibrium mixture of ortho and para hydrogen
b) In ortho hydrogen spin of two 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.

Q.7. The O – O – H bond angle in H_2O_2 is

a) 106°
b) 109°28'
c) 120°
d) 94.8°

Q.8. 2 g of aluminium is treated separately with excess of dilute H_2SO_2 and excess of NaOH. The ratio of the volumes of hydrogen evolved is

a) 2 : 3
b) 1 : 1
c) 2 : 1
d) 1 : 2

Q.9.The critical temperature of water is higher than that of O_2 because H_2O molecule has

a) fewer electrons than oxygen
b) two covalent bonds
c) v-shape
d) dipole moment

Q.10. Which of the following species is diamagnetic in nature?

a) H_2^-
b) H_2^+
c) H_2
d) He_2^+

Q.11. Moist H_2O_2 cannot be dried over conc. H_2SO_4 because:

a) it can catch fire
b) it is reduced by H_2SO_4
c) it is oxidised by H_2SO_4
d) None of these is true

Q.12. Which is used as a moderator in a nuclear reactor?

a) H_2O
b) Alum
c) D_2O
d) Any of these

Q.13. Zeolite used to soften hardness of water is hydrated:

a) Potassium aluminium borate
b) Sodium aluminium silicate
c) Calcium aluminium silicate
d) Zinc aluminium borate

Q.14. Permanent hardness from water can be removed by adding

a) Na_2CO_3
b) K
c) Ca(OCl)Cl
d) Cl_2

Q.15. The adsorption of hydrogen by palladium is called

a) Hydrogenation

b) Hydration
c) Reduction
d) Occlusion

Q.16. Para and ortho hydrogen differ in
a) Atomic number
b) Atomic mass
c) Spins of nuclei
d) Number of neutrons

Q.17. The reagent commonly used to determine hardness of water titrimetrically is
a) Oxalic acid
b) Disodium salt of EDTA
c) Sodium citrate
d) Sodium thiosulphate

Q.18. Heavy water is obtained by
a) Boiling water
b) Fractional distillation of water
c) Prolonged electrolysis of water
d) Heating H_2O_2

Q.19. Polyphosphates are used as water softening agents because they
a) Form soluble complexes with an ionic species
b) Precipitate an ionic species
c) Form soluble complexes with cationic species
d) Precipitate cationic species.

Q.20. Which of the following pairs of substances on reaction .will not evolve $H_2(g)$?
a) Fe and H_2SO_4
b) Copper and HCl (aqueous)
c) Sodium and ethyl alcohol
d) Iron and steam

Q.21. Hydrolysis of one mole of Peroxidic sulphuric acid produces
a) Two moles of sulphuric acid
b) Two moles of peroxomonosulphuric acid
c) One mole of sulphuric acid and one mole of peroxomonosulphuric acid
d) One mole of sulphuric acid, and one mole of peroxomonosulphuric acid and one mole of hydrogen peroxide.

Q.22. 30 volumes of H_2O_2 means
a) 30% H_2O_2
b) 30 cm^3 of the solution, contains lg of H_2O_2
c) 1 cm^3 of the solution liberates 30 cm^3 of O2 at STP
d) 30 cm^3 of the solution contain 1 mole of H_2O_2

Q.23. The volume of 10 volume H_2O_2 solution that decolourises 200 ml. of 2N $KMnO_4$ solution in acidic medium is

a) 112 ml
b) 336 ml
c) 200 ml
d) 224 ml

Q.24. Which of the following is a true peroxide?

a) NO_2
b) MnO_2
c) BaO_2
d) SO_2

Q.25. The oxidation states of the most electronegative element in the products of the 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