Department of Science & Humanities (Chemistry)

UNIT 1 – WATER AND ITS TREATMENT

QUESTION BANK

1. The water is said to be hard, when it

contains a) Dissolved sodium salts

b) Acid solution

c) **Dissolved Ca and Mg salts**

d) Precipitate in

suspension Answer: (c)

2. Hardness in water is mainly caused by the presence of

a) Sodium chloride

b) Sodium carbonate

c) Calcium chloride

d) Potassium

nitrate. Answer: (c)

3. A sample of water containing sodium chloride is

a) Soft water

b) Hard water

c) Moderately hard

d) Mineral water

Answer: (a)

4. Carbonate hardness in water can be removed by

a) Filtration

b**) Boiling**

c) Sedimentation

d) Washing

Answer: (b)

5. Permanent hardness in water is not caused by the presence

of a) Calcium chloride

b) Magnesium sulphate

c) Calcium sulphate

d) **Magnesium carbonate**

6. Solubility of calcium sulphate in water

a) **Increases with rise of temperature**

b) Decreases with rise of temperature

c) Remains unaltered with rise of temperature

d) Does not follow any definite pattern with rise of

temperature. Answer: (a)

6. Which one of the following is not a unit of hardness

a) mg/l

b) ppm

c**) mg**

d) Cl_2

Answer: (c)

7. What is the equivalent weight of $CaCO_3$

a) 30

b) 40

c) 50

d) 60

Answer: (c)

8.Which of the following is equal to 1ppm?

a. 0.07 Cl_2

b. 0.07 Cl

o

c. 0.1$_{O}$Cl

d. 2.0 Cl

Answer: (a)

9. Hardness is expressed in terms of---------equivalents

a. CaSO4

b. Mg(HCO3)2

c. CaCO3

d. CaCl2

10. What is the role of

EDTA a) Analyte

b) Buffer

c**) Ligand**

d) Indicator

Answer: (c)

11. A buffer solution is a mixture of -------- & --------

a) Strong acid & strong base

b) Strong base & its salt

c) Weak acid & weak base

d) Weak base & its salt

12. The end point of the determination of hardness by EDTA is -----

a) Colourless to steel blue

b) Steel blue to colourless

c) **Wine red to steel blue**

d) Wine red to

colourless Answer: (c)

13. Which form of EDTA is soluble in

water? a. Monohydrated salt

b. Dihydrated salt

c. Monosodium salt

d. Disodium salt

Answer: (d)

14. The estimation of salt content in water by EDTA titration can be used to determine ---------- of the sample water.

a. Alkalinity

b. pH

c. Hardness

d. Total dissolved salts

15. The maximum number of binding sites in EDTA are

a. 2

b. 4

c. 6

d. 8

16. Hard water is unfit for use in boilers for generating steam because ------

a. Its boiling point is higher

b. It causes foaming

c. Water decomposes into O2 and H2

d. It produces scales inside the boilers

Answer: (d)

17. The slimy and non adherent precipitate suspended on the surface of boiled hard water is called

a. Scale

b. Sludge

c. Formig

d. Priming

Answer: (b)

18. The hard and adherent precipitate formed on the sides of the boiler is called -----

a. Scale

b. Sludge

c. Formig

d. Priming

19. Soft water is not a demineralized water whereas a demineralized water is soft water because ------

a. Soft water does not contain sodium, potassium, sulfate, chloride ions

b. Soft water contains sodium, potassium, sulfate, chloride ions

c. Calcium and magnesium ions present in demineralized water

d. Soft water does not gives lather

20. The maximum concentration of total dissolved salts in drinking water should be ------

a. 1000 ppm

b. 500 ppm

c. 200 ppm

d. 100 ppm

21. Which one of the following is anion exchange resin?

a. Urea-formaldehyde resin

b. Sulphonated polystyrene

c. Carbonated coal

d. Nylone 6,6 resin

Answer: (a)

22. Calgon is a trade name given to --------

a. Sodium silicate

b. Calcium phosphate

c. Sodium hexametaphosphate

d. Sodium Zeolite

Answer: (c)

23. Colloidal conditioning agent is --------

a. EDTA

b. Disodium hydrogen phosphate

c. Calgon

d. Gelatin

Answer: (d)

24. The basis of reverse osmosis is

a) Osmotic pressure is greater than hydrostatic pressure

b) Osmotic pressure is equal to hydrostatic pressure

c) Hydrostatic pressure is greater than osmotic pressure

d) Osmotic pressure does not exist

Answer: (c)

25. In Reverse osmosis the solvent was moved from ……..

a) Higher concentration to lower concentration

b) Lower concentration to higher concentration

c) No movement of solvent

d) High temp to lower temp

Answer: (a)

Department of Science & Humanities (Chemistry)

UNIT 3 – ALLOYS AND PHASE RULE

1. An alloy is a

a. Pure metal

b. Mixture of metals in any proportion

c. Mixture of metals in fixed proportion

d. Mixture of two non metals Answer (d)

2.The alloy used for dental filling is

a. Amalgam

b. Brass

c. Bronze

d. Manganin

Answer (a)

3.Which of the following is not an alloy?

a. Steel

b. Copper

c. Brass

d. Bronze

Answer (a)

4.By adding chromium to steel which of the following property is enhanced?

a. Resistance to corrosion

b. Electrical characteristics

c. Magnetic property

d. Ductility

Answer (a)

5.The first alloy made by humans was

a. Steel

b. Brass

c. Bronze

d. Mild steel

Answer(c)

6. Brass is an alloy of …….

a. Copper and Nickel

b. Copper and Iron

c. Copper and Tin

d. Copper and

Zinc Answer (d)

7. Which of the following alloy has copper as a major constituent?

a. Gun metal

b Magnox

c. Nichrome

d. Satellite

Answer (d)

8. Brass is an alloy of

a. Copper and tin

b. Copper and nickel

c. Copper and Aluminium.

d. Copper and

zinc Answer(d)

9.Duralumin is an alloy of

a.Aluminium and Copper

b.Aluminium and iron

c. Aluminium and Carbon

d.Aluminium and mercury

Answer(a)

10.Which of the following alloy is used in making aircraft structures?

a .Duralumin

b.Brass

c.Bronze

d.Manganin

Answer(a)

11. At a triple point……

A. three phases co-exist in equilibrium

B. the vapour pressure is equal to the atmospheric pressure

C. there are three components in equilibrium

D. there are three degrees of freedom

Answer: (a)

12.. For one component system, at triple point the number of degrees of freedom is

A. zero

B. one

C. two

D. three

Answer: (a)

13. For one component system, there does not exist a quadruple point as the number of degrees of freedom cannot be

A. zero

B. –1

C. 1

D. 2

Answer: (b)

14. In a single – component condensed system, if degree of freedom is zero, maximum number of phases that can co – exist _____

a**) 2**

b) 3

c) 0

d) 1

Answer: (a)

15. The degree of freedom at a triple point in the unary diagram for water is _____

a) 2

b) 3

c) 0

d) 1

Answer: (c)

16. What is degree of freedom for single – phase fields on the phase diagram?

a) 2

b) 3

c) 0

d) 1

17. For single component system when degree of freedom is 1(one) then number of phases a) 2

b) 3

c) 0

d**) 1**

18. What is Gibbs phase rule for general

system? a) P = C – 1 – F

b) P = C + 1 – F

c) P + F = C – 2

d) **P + F = C + 2**

Answer: (d)

19. What is Gibbs phase rule for metallurgical system? a) F = C – 1 – P

b) **F = C + 1 – P**

c) P+F=C–2

d) P+F=C+2

Answer: (b)

20. In a single – component condensed system, if degree of freedom is zero, maximum number of phases that can co – exist _____

a) 2

b) 3

c) 0

d) 1

Answer: (a)

21. Select the wrong statements from the following statements with respect to a phase diagram.

a) Gives information about concentration

b) Gives information about solubility

c) Gives information on melting and boiling points

d) Gives information on relative concentration

22. Select the odd statement with respect to a phase reaction. a) **Saturated solution**

b) Equilibrium solution

c) Concentric solution

d) Amorphous solution

Answer: (a)

23. Calculate the eutectic concentration given the following data.

Pressure= 1atm

Temperature: 1 ^{o}C

a) 0

b) 2

c**) 1**

d) 3

Answer: (c)

24. Under what condition, will we get a stable phase diagram?

a) Solid + Liquid

b) Solid + Vapor

c) Liquid + vapor

d) Liquid + Solid

Answer: (a)

25. What is the point at which all the three phases of a system exist?

a) Triple point

b) Sublimation point

c) Vapor point

d) Eutectic point

Answer: (a)

Department of Science & Humanities (Chemistry)

Unit-V - ENERGY SOURCES AND STORAGE DEVICES

1. The process of splitting of heavier nucleus into two (or) more smaller nuclei with liberation of large amount of energy is known as ----------

   A. Nuclear fusion

   B. Nuclear fission

   C. Nuclear energy

   D. Radiation energy

   Answer: (B)

2. Naturally-occurring Uranium is a mixture of --------- and ----------

   A. U-235 & U-238

   B. U-235 & Th-238

   C. U-235 & U-236

   D. U-235 & Pu-239

   Answer: (A)

3. Atomic weight of fission products ranges from about ----------.

   A. 70 to 100

   B. 70 to 120

   C. 70 to 160

   D. 70 to 235

   Answer: (B)

4. Chain reactions can be controlled and maintained steadily by absorbing a desired number of neutrons.

A. Protons

B. Neutrons

C. Electrons

D. Positrons

Answer: (B)

5. The number of neutrons, resulting from a single fission is known as ----------.

A. Energy factor

B. Emission factor

C. Multiplication factor

D. Division factor

Answer: (C)

6. The energy of stars and sun is aroused from ---------- reactions.

A. fusion

B. fission

C. nuclear

D. thermal

Answer: (A)

7. A type of reaction, where the neutrons from the previous step continue to propagate and repeat the reaction is called ----------.

A. nuclear chain reaction

B. radioactive reaction

C. solar reaction

D. spontaneous reaction

Answer: (A)

8. The minimum amount of fissionable material (U) required continuing the nuclear chain reaction is called ----------

A. sub-critical mass

B. super- critical mass

C. critical mass

D. atomic mass

Answer: (C)

9. The most nuclear fuel used in the world is --------

A. Thorium – 232

B. Uranium – 238

C. Uranium – 235

D. Plutonium – 239

Answer: (C)

10. Amongst the following, the fissionable materials are ----------

A. U233 and Pu239

B. U231 and Pu233

C. U235 and Pu235

D. U238 and Pu239

Answer: (A)

11. Moderator in nuclear plants is used to ----------

A. extract heat from nuclear reaction

B. control the reaction

C. to reduce the speed (K.E) of neutrons

D. moderate the radioactive pollution

12. The most commonly used moderator in nuclear plants is ----------

A. heavy water

B. concrete and bricks

C. graphite and concrete

D. **graphite**

Answer: (D)

13. Breeder reactor has a conversion ratio of --------

A. unity

B. more than unity

C. less than unity

D. infinity

Answer: (B)

14. The commonly used material for shielding is ----------

A. lead or concrete

B. lead and tin

C. graphite or cadmium

D. thick galvanized sheets

Answer: (A)

15. Which of the following can be used as a coolant in nuclear plant?

A. molten lead

B. carbon dioxide

C. light or heavy water

D. carbon tetrachloride

Answer: (C)

16. Name the moderator used in the nuclear reactor?

A. Plutonium

B. Thorium

C. Graphite

D. Berilium

Answer: (C)

17. Which isotope of Uranium has the capacity to sustain the chain reaction?

A. U-230

B. U-235

C. U-245

D. U-225

Answer: (B)

18. During an atomic explosion, the energy released is due to

A. Conversion of protons to neutrons

B. Conversion of chemical energy into heat energy

C. Conversion of mechanical energy into nuclear energy

D. **Conversion of mass into**

energy Answer: (D)

19. What is the beneficial aspect of nuclear fission?

A. The ability to absorb energy

B. The ability to produce more energy than nuclear fusion

C. The ability to release tremendous amounts of energy

D. There are no beneficial aspects of nuclear

fission Answer: (C)

20. Heavy Water (D2O) in a nuclear reactor, serves as ----------

A. Coolant

B. Moderator

C. Both Coolant and Moderator

D. Neutron absorber

Answer: (C)

21. Use of molten metal as a coolant in fast breedor reactor helps in ----------

A. Rapid heat transfer from the core

B. Accelerating the reaction rate in the core

C. Breeding neutrons

D. Accelerating the

neutrons Answer: (B)

22. ---------- produces heat energy and neutrons that starts nuclear chain reaction.

A. Fuel rods

B. Control rods

C. Moderators

D. Coolants

Answer: (A)

23. To control the fission reaction (Rate), movable rods, made of ---------

A. Graphite

B. Heavy water

C. Cd (or) B

D. Uranium rods

Answer: (C)

24. ---------- converts the non-fissionable material (U^{238}) into fissionable material (Pu^{239}).

A. Thermal reactor

B. Nuclear reactor

C. **Breedor reactor**

D. Atomic reactor

Answer: (C)

25. The non-fissionable nucleides such as U^{238} & Th^{232} are called -------

A. Fissile nuclides

B. Fertile nuclides

C. Non-fissile nuclides

D. Non-fertile nuclides

Answer: (B)