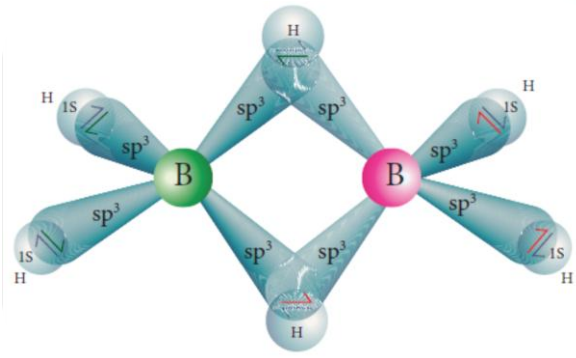
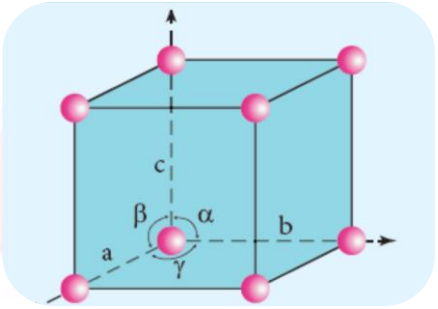
XII - Chemistry

Volume - I

UNITWISE

EVALUATION and ADDITIONAL ONE MARK QUESTIONS with ANSWER KEY





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CONTENTS

1. METALLURGY

Choose the correct answer:

1. Bauxite has the composition

a) Al_2O_3 b) $Al_2O_3.nH_2O$ c) $Fe_2O_3.2H_2O$ d)None of these

2. Roasting of sulphide ore gives the gas (A).(A) is a colourless gas. Aqueous solution of (A) is acidic. The gas (A) is

a)CO_2 b)SO_3 c)SO_2 d)H_2S

3. Which one of the following reaction represents calcinations?

a) $2Zn + O_2 \rightarrow 2ZnO$ b) $2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$

c) $MgCO_3 \rightarrow MgO + CO_2$ d) Both (a) and (c)

4. The metal oxide which cannot be reduced to metal by carbon is

a) PbO b) Al_2O_3 c) ZnO d) FeO

5. Which of the metal is extracted by Hall-Herold process?

a) Al b) Ni c) Cu d) Zn

6. Which of the following statements, about the advantage of roasting of sulphide ore before reduction is not true?

a) ΔG_f^o of sulphide is greater than those for CS_2 and H_2S .

b) ΔG_r^o is negative for roasting of sulphide ore to oxide

c) Roasting of the sulphide to its oxide is thermodynamically feasible.

d) Carbon and hydrogen are suitable reducing agents for metal sulphides

7.Match items in column - I with the items of column – II and assign the correct code

Column – I	Column – 2		A	B	C	D
A Cyanide process	(i) Ultrapure Ge	a)	(i)	(ii)	(iii)	(iv)
B Froth flotation process	(ii) Dressing of ZnS	b)	(iii)	(iv)	(v)	(i)
C Electrolytic refining	(iii) Extraction of Al	c)	(iv)	(ii)	(iii)	(i)
D Zone refining	(iv) Extraction of Au	d)	(ii)	(iii)	(i)	(v)
	(v) Purification of Ni					

8. Wolframite ore is separated from tinstone by the process of

a) Smelting b) Calcination c) Roasting d) Electromagnetic separation

9. Which one of the following is not feasible

a) $Zn(s) + Cu^{2+}(aq) \rightarrow Cu(s) + Zn^{2+}(aq)$ b) $Cu(s) + Zn^{2+}(aq) \rightarrow Zn(s) + Cu^{2+}(aq)$

c) $Cu(s) + 2Ag^{+}(aq) \rightarrow Ag(s) + Cu^{2+}(aq)$ d) $Fe(s) + Cu^{2+}(aq) \rightarrow Cu(s) + Fe^{2+}(aq)$

10. Electrochemical process is used to extract

a) Iron b) Lead c) Sodium d) silver

11. Flux is a substance which is used to convert

a) Mineral into silicate b) Infusible impurities to soluble impurities

c) Soluble impurities to infusible impurities d) All of these

12. Which one of the following ores is best concentrated by froth – floatation method?

a) Magnetite b) Hematite c) Galena d) Cassiterite

13. In the extraction of aluminium from alumina by electrolysis, cryolite is added to

a) Lower the melting point of alumina b) Remove impurities from alumina

c) Decrease the electrical conductivity d) Increase the rate of reduction

14. Zinc is obtained from ZnO by

a) Carbon reduction b) Reduction using silver

c) Electrochemical process d) Acid leaching

15. Extraction of gold and silver involves leaching with cyanide ion. silver is later recovered By

a) Distillation b) Zone refining c) Displacement with zinc d) liquation

16. Considering Ellingham diagram, which of the following metals can be used to reduce alumina? a) Fe b) Cu c) Mg d) Zn

17.The following set of reactions are used in refining Zirconium

$$Zr\ (impure) + 2I_2 \xrightarrow{523\ K} ZrI_4$$
$$ZrI_4 \xrightarrow{1800K} Zr\ (pure) + 2I_2$$

This method is known as

a) Liquation b) van Arkel process c) Zone refining d) Mond's process

18. Which of the following is used for concentrating ore in metallurgy?

a) Leaching b) Roasting c) Froth floatation d) Both (a) and (c)

19. The incorrect statement among the following is

a) Nickel is refined by Mond's process b) Titanium is refined by Van Arkel's process

c) Zinc blende is concentrated by froth floatation

d) In the metallurgy of gold, the metal is leached with dilute sodium chloride solution

20. In the electrolytic refining of copper, which one of the following is used as anode?

a) Pure copper b) Impure copper c) Carbon rod d) Platinum electrode

21. In the Ellingham diagram, for the formation of carbon monoxide

a) $\Delta S^{o}/\Delta T$ is negative b) $\Delta G^{o}/\Delta T$ is positive

c) $\Delta G^{o}/\Delta T$ is negative d) initially $\Delta T/\ \Delta G^{o}$ is positive, after $700^{o}C$, $\Delta G^{o}/\Delta T$ is negative

22. Which of the following plot gives Ellingham diagram

a) ΔS Vs T b) ΔG^{o} Vs T c) ΔG^{o} Vs 1/T is negative d) ΔG^{o} Vs T^{2} is negative

23. Which of the following reduction is not thermodynamically feasible?

a) $Cr_2O_3 + 2Al \rightarrow Al_2O_3 + 2Cr$ b) $Al_2O_3 + 2Cr \rightarrow Cr_2O_3 + 2Al$

c) $3TiO_2 + 4Al \rightarrow 2\ Al_2O_3 + 3Ti$ d) none of these

24. Which of the following is not true with respect to Ellingham diagram?

a) Free energy changes follow a straight line. Deviation occurs when there is a phase change.

b) The graph for the formation of CO_2 is a straight line almost parallel to free energy axis.

c) Negative slope of CO shows that it becomes more stable with increase in temperature.

d) Positive slope of metal oxides shows that their stabilities decrease with increase in temperature.

ADDITIONAL QUESTIONS :

1. Which metal is used for extraction of Au and Ag and also for galvanization of iron object?

a) Mg b) Zn c) Cr d) Co

2. Which of the following is not a mineral of aluminium?

a) Bauxite b) Cryolite c) China clay d) Malachite

3. Name the process by which elements such as germanium ,silicon and galium are refined.

a) Vapour phase method b) Electrolytic refining

c) Zone refining d) Van–Arkel method.

4.In the extraction of copper from its sulphide ore, the metal is finally obtained by the reduction of cuprous oxide with a)Iron sulphide(FeS) b) Carbon monoxide(CO) c) Copper (I)sulphide (Cu2S) d) Sulphur dioxide (SO2)

5.Concentration 0f copper glance is done by

a) leaching b) magnetic separation c) froth flotation d) hydraulic washing

6. Zone refining is based on a) fractional distillation b) simple distillation c) sublimation d) fractional crystallization

7.The process of heating of copper pyrites to remove sulphur is called

a)froth flotation b)roasting c) calcination d) smelting

8.Malachite has _____ composition.

a) $2CuCO_3.Cu(OH)_2$ b) $CuCO_3Cu(OH)_2$ c) Cu_2O d) Cu_2S

9.Zinc blende is _____ a)ZnS b) PbS c) Ag_2S d) Cu_2S

10.In acid leaching process, the insoluble sulphide is converted into soluble sulphate and elemental _____a)Carbon b) Lead c) Sulphur d) Zinc

11.Gibb's free energy is given by _____

a) $\Delta G^o = -nFE^o$ b) $\Delta G^o = nF$ c) $\Delta G^o = nFE^o$ d) $\Delta E^o = -nFG^o$

12.In the metallurgy of iron, limestone is added to coke .which acts as a_____

a) reducing agent b) oxidizing agent c) slag d) Flux

13.Froth flotation process is suitable for concentrating _____ore.

a) Oxide b) Carbonate c) Sulphide d)Halide

14.Metal oxide is converted into metal by

a) Calcination b) Roasting c) Smelting d) Bessemerisation

15.In Hall-Herold process, _____act as an anode.

a)Carbon blocks b) Hydrogen c)Copper rods d)Zinc rods

16. In froth floatation sodium ethyl Xanthate is used as a

a) Collector b) depressing agent c) frothing agent d) Flux

17. Which method is based on the solubility of the ore in a suitable solvent

a) Gravity separation b) Hydraulic wash c) Leaching d) Magnetic separation

18. Tin stone , Chromite and Pyrolusite are concentrated by ---------- process.

a) Gravity separation b) Hydraulic wash c) Froth flotation d) Magnetic separation

19.The process of ore into metal oxide with absence of air is called

a) Oxidation b) Cementation c) Galvanization d) Calcination

20. Metals having low melting points such as tin, lead, mercury and bismuth are refined by

a) Distillation b) Liquation c) Electrolytic d) Zone refining

21. Which one is used in the manufacture of many products such as paints, rubber, cosmetics. a) Zinc carbonate b) Zinc oxide c) Zinc metal d) Zinc sulphide

22. Which one is used for cutting tools and crushing machines.

a) Nickel steel b) Chrome steel c) Chrome vanadium steel d) Nichrome

23.Elingham diagram helps to select a) suitable reducing agent b) appropriate temperature c) both (a) and (b) d) oxidizing agent

24. The complex formed when NaCN is added to galena in which ZnS is the impurity

a) $2Na[Zn(CN)_4]$ b) $Na_2[Zn(CN)_4]$ c) $2Zn[Na(CN)_2]$ d) $Na_4[Zn(CN)_4]$

25. Depressing agents used to separate ZnS from PbS is

a) NaCN b) NaCl c) $NaNO_3$ d) $NaNO_2$

26. Which type of leaching process convert insoluble sulphide ore into soluble sulphates?

a) cyanide leaching b) alkali leaching c) acid leaching d) hand picking

2. P BLOCK ELEMENTS – I

1. An aqueous solution of borax is ……

(a) neutral (b) acidic (c) basic (d) amphoteric

2. Boric acid is an acid because its molecule ……

(a) contains replaceable H^+ ion (b) gives up a proton

(c) combines with proton to form water molecule

(d) accepts OH^- from water, releasing proton.

3. Which among the following is not a borane?

(a) B_2H_6 (b) B_3H_6 (C) B_4H_{10} (d) none of these

4. Which of the following metals has the largest abundance in the earth's crust?

(a) Aluminium (b) calcium (c) Magnesium (d) Sodium

5. In diborane, the number of electrons that accounts for banana bonds is ……

(a) six (b) two (c) four (d) three

6. The element that does not show catenation among the following p-block elements is ……

(a) Carbon (b) silicon (c) Lead (d) germanium

7. Carbon atoms in fullerene with formula C_{60} have …… (a) sp^3 hybridised

(b) sp hybridized (c) sp^2 hybridised (d) partially sp^2 and partially sp^3 hybridised

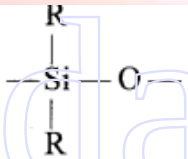
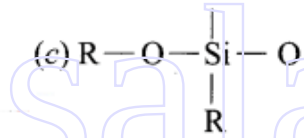
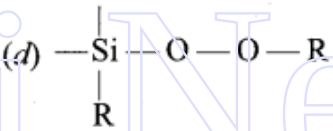
8. Oxidation state of carbon in its hydrides ……

(a) +4 (b) -4 (c) +3 (d) +2

9. The basic structural unit of silicates is ……

(a) $(SiO_3)^{2-}$ (b) $(SiO_4)^{2-}$ (c) $(SiO)^{-}$ (d) $(SiO_4)^{4-}$

10. The repeating unit in silicone is ……

(a) SiO_2 (b)  (c)  (d) 

11. Which of these is not a monomer for a high molecular mass silicone polymer?

(a) Me_3SiCl (b) $PhSiCl_3$ (c) $MeSiCl_3$ (d) Me_3SiCl_3

12. Which of the following is not sp^2 hybridised?

(a) Graphite (b) grapheme (c) Fullerene (d) dry ice

13. The geometry at which carbon atom in diamond are bonded to each other is ……

(a) Tetrahedral (b) hexagonal (c) Octahedral (d) none of these

14. Which of the following statements is not correct?

(a) Beryl is a cyclic silicate (b) Mg_2SiO_4 is an orthosilicate

(c) SiO_4^{4-} is the basic structural unit of silicates (d) Feldspar is not aluminosilicate

15. Match items in column – I with the items of column – II ans assign the correct code

Column-I	Column-II
A Borazole	1. $B(OH)_3$
B Boric acid	2. $B_3N_3H_6$
C Quartz	3. $Na_2[B_4O_5(OH)_4]\ 8H_2O$
D Borax	4. SiO_2

	A	B	C	D
(*a*)	2	1	4	3
(*b*)	1	2	4	3
(*c*)	1	2	4	3
(*d*)	None of these			

16. Duralumin is an alloy of ……

(a) Cu, Mn (b) Cu, Al, Mg (c) Al, Mn (d) Al, Cu, Mn, Mg

17. The compound that is used in nuclear reactors as protective shields and control rods is ……

(a) Metal borides (b) metal oxides (c) Metal carbonates (d) metal carbide

18. The stability of +1 oxidation state increases in the sequence ……

(a) Al < Ga < In < Tl (b) Tl < In < Ga < Al (c) In < Tl < Ga < Al (d) Ga< In < Al < Tl

ADDITIONAL QUESTIONS :

1. More common oxidation state for halogens is ……

(a) +1 (b) +2 (c) -1 (d) -2

2. Electronic configuration of noble gases is ……

(a) ns^2 (b) ns^2np^5 (c) ns^1np^6 (d) ns^2np^6

3. Noble gases are chemically inert. This is due to ……

(a) unstable electronic configuration (b) stable electronic configuration

(c) only filled p-orbital (d) only filled 5-orbital

4. Noble gases are chemically inert. This is due to ……

(a) unstable electronic configuration (b) stable electronic configuration

(c) only filled p-orbital (d) only filled 5-orbital

5. Which one of the following is the strongest oxidising agent?

(a) Fluorine (b) Chlorine (c) Bromine (d) Iodine

6. Some elements exist in more than one crystalline or molecular forms in the same physical state is called ……(a) isomerism (b) allotropism (c) isomorphism (d) isoelectronics

7. How many allotropes possible for boron? (a) 1 (b) 4 (c) 6 (d) 7

8. Important ore of boron is (a) bauxite (b) borosilicate (c) borax (d) P-tetragonal boron

9. Borontrifluoride reacts with sodium hydride at 450 K gives ……

(a) diborane (b) tetraborane (c) pentaborane (d) decaborane

10. Boron reacts with fused sodium hydroxide to forms ……

(a) Borax (b) Boric acid (c) Sodium borate (d) Sodium tetraborate

11. Which isotope is used as moderator in nuclear reactors?

(a) $^{10}B_5$ (b) $^{n}C_6$ (c) $^{4}He_2$ (d) $^{40}Ca_2$

12. Compounds used as an eye lotion ……

(a) H_3BO_3 (b) HBO_2 (c) $H_2B_4O_7$ (d) B_2O_3

13. Which one of the following is called as inorganic benzene?

(a) B_2H_6 (b) BN (c) $H_2B_4O_7$ (d) $B_3N_3H_6$

14. Diborane reacts with excess ammonia at high temperature to give ……

(a) Boron nitride (b) Boron oxide (c) Borazole (d) Diborane diammonate

15. Consider the following statements.

(i) Diborane contains two centre-two electron bond.

(ii) In diborane, the boron has sp^3 hybridis ed.

(iii) Diborane has two terminal B – H bonds and four B – H – B bonds.

Which of the above statement(s) is/are correct.

(a) (i) and (iii) (b) (ii) and (iii) (c) (i) only (d) (i) and (ii)

16. The structure of graphite is …… (a) planner (b) hexagonal (c) octahedral (d) bucky balls

17. CO and N_2 mixture is ……

(a) natural gas (b) producer gas (c) water gas (d) LPG

18. Syn gas is ……(a) $CO + N_2$ (b) $CO + H_2$ (c) $CO_2 + H_2$ (d) $CO_2 + N_2$

19. Critical temperature of CO_2 is …….

(a) -31°C (b) -13°C (c) 31°C (d) 13°C

20. Ortho silicates are also called as ……. (a) Ino silicates (b) Soro silicates (c) Neso silicates (d) Cyclic silicates

21. Example of Ring silicate is ……. (a) Olivine (b) Beryl (c) Spodumene (d) Asbestos

22. Compound used to remove the permanent hardness of water is …….

(a) Zeolite (b) Feldspar (c) Talc (d) Mica

23. Pick out the three dimensional silicates? (a) Talc (b) Mica (c) Quartz (d) Asbestos

3. P BLOCK ELEMENTS – II

1. In which of the following, NH_3 is not used?

(a) Nessler's reagent (b) Reagent for the analysis of IV group basic radical

(c) Reagent for the analysis of III group basic radical (d) Tollen's reagent

2. Which is time regarding nitrogen?

(a) least electronegative element (b) has low ionisation enthalpy than oxygen

(c) d-orbitals available (d) ability to form pπ – pπ bonds with itself

3. An element belongs to group 15 and 3 rd period of the periodic table, its electronic configuration would be …… (a) $1s^2 2s^2 2p^4$ (b) $1s^2 2s^2 2p^3$ (c) $1s^2 2s^2 2p^6 3s^2 3p^2$ (d) $1s^2 2s^2 2p^6 3s^2 3p^3$

4. Solid (A) reacts with strong aqueous NaOH liberating a foul smelling gas(B) which spontaneously bum in air giving smoky rings. A and B are respectively ……

(a) P_4(red) and PH_3 (b) P_4(white) and PH_3

(c) S_8 and H_2S (d) P_4(white) and H_2S

5. On hydrolysis, PCl_3 gives (a) H_3PO_3 (b) PH_3 (c) H_3PO_4 (d) $POCl_3$

6. P_4O_6 reacts with cold water to give ……

(a) H_3PO_3 (b) $H_4P_2O_7$ (c) HPO_3 (d) H_3PO_4

7. The basicity of pyrophosphorous acid ($H_4P_2O_5$) is ……

(a) 4 (b) 2 (c) 3 (d) 5

8. The molarity of given orthophosphoric acid solution is 2M. its normality is ……

(a) 6N (b) 4N (c) 2N (d) none of these

9. Assertion – bond dissociation energy of fluorine is greater than chlorine gas

Reason – chlorine has more electronic repulsion than fluorine

(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.

10. Among the following, which is the strongest oxidizing agent?

(a) Cl_2 (b) F_2 (c) Br_2 (d) I_2

11. The correct order of the thermal stability of hydrogen halide is ……(a) HI > HBr > HCl > HF

(b) HF > HCl > HBr > HI (c) HCl > HF > HBr > HI (d) HI > HCl > HF > HBr

12. Which one of the following compounds is not formed?

(a) $XeOF_4$ (b) XeO_3 (c) XeF_2 (d) NeF_2

13. Most easily liquefiable gas is ……

(a) Ar (b) Ne (c) He (d) Kr

14. XeF_6 on complete hydrolysis produces ……

(a) $XeOF_4$ (b) XeO_2F_4 (c) XeO_3 (d) XeO_2

15.Which of the following is strongest acid among all?

(a) HI (b) HF (c) HBr (d) HCl

16. Which one of the following orders is correct for the bond dissociation enthalpy of halogen molecules? (a) $Br_2 > I_2 > F_2 > Cl_2$ (b) $F_2 > Cl_2 > Br_2 > I_2$ (c) $I_2 > Br_2 > Cl_2 > F_2$ (d) $Cl_2 > Br_2 > F_2 > I_2$

17. Among the following the correct order of acidity is ……

(a) $HClO_2 < HClO < HClO_3 < HClO_4$ (b) $HClO_4 < HClO_2 < HClO < HClO_3$

(c) $HClO_3 < HClO_4 < HClO_2 < HClO$ (d) $HClO < HClO_2 < HClO_3 < HClO_4$

18. When copper is heated with cone HNO_3 it produces ……

(a) $Cu(NO_3)_2$, NO and NO_2 (b) $Cu(NO_3)_2$ and N_2O

(c) CU(NO3)2 and NO2 (d) Cu(NO3)2 and NO

ADDITIONAL QUESTIONS :

1. Nitrogen gas in atmosphere is separated industrially from liquid air by ……

(a) simple distillation (b) Fractional distillation

(c) Sublimation (d) Distillation under reduced pressure

2. Which one of the following is used in cryosurgery?

(a) Liq N_2 (b) Liq NH_3 (c) Liq Na (d) Liq H_2

3. The dielectric constant of ammonia is (K) ……

(a) 10^{-30} (b) 10^{-14} (c) 10^{30} (d) 10^{14}

4. H – N – H bond angle in NH3 is ……(a) 109° 28’ (b) 107° 28’ (c) 104° (d) 107°

5. Shape of ammonia is ……(a) Planar (b) Square planar (c) Pyramidal (d) Square pyramidal

6. Nitric acid prepared in large scales using ……(a) Ostwald’s process (b) Haber’s process

(c) Contact process (d) Deacon’s process

7. Benzene undergoes nitration reaction to form nitrobenzene in this reaction takes place due to the formation of ……(a) Hydronium ion (b) Hydride ion

(c) Nitronium ion (d) Nitrasonium ion

8. Compound used in photography is ……(a) $AgNO_3$ (b) AgBr (c) AgCl (d) AgI

9. Sodium nitrate (a) Photography (b) Firearms (c) Royal water (d) Cryosurgery

10. White (Yellow) phosphorous glows in the dark due to oxidation which is called ……

(a) phosphorescence (b) phosphorus (c) Fluorescence (d) Liminoscence

11. Yellow phosphorous reacts with alkali on boiling in an inert atmosphere liberates ……

(a) Phosphorous acid (b) Phosphoric acid (c) Phosphine (d) Pyrophosphoric acid

12. Hybridisation of P in phosphine is ……(a) sp^3d (b) sp^3d^2 (c) sp^3d^3 (d) sp^3

13. Compounds used in Holme’s signal are ……(a) Phosphine + Acetylene (b) H_3PO_3+H_3PO_3

(c) Calcium carbide + calcium phosphide (d) Calcium carbonate + calcium phosphate

14. Shape of ozone ……(a) V-shape (b) Linear shape (c) bent shape (d) spherical shape

15. Sulphur di oxide, how many times heavier than air?

(a) 2 times (b) 2.5 times (c) 2.2 times (d) 2.3 times

16. Sulphuric acid can be manufactured by ……(a) Ostwald's process (b) Lead chamber process (c) Deacon's process (d) Haber's process

17. Sulphuric acid is manufactured by contact process, catalyst used in contact process is ……

(a) V_2O_5 (b) $TiCl_4$ (c) Fe (d) Mo

18. Deacon's process is used to manufacture ……(a) Cl_2 (b) F_2 (C) Br (d) I_2

19. Catalyst used in Deacon's process is ……(a) $CuCl_2$ (b) Cu_2Cl_2 (c) CuBr (d) Cu_2Br_2

20. Passing chlorine gas through dry slaked lime to produce ……(a) CaOCl (b) $CaOCl_2$ (c) CaO (d) $CaCl_2$

21. Which one of the following is a weak acid? (a) HF (b) HCl (c) HBr (d) HI

22. Reagent not stored in glass bottles? (a) HCl (b) HBr (c) HF (d) HI

23. The correct order of the acidity of hydrohalic acids? (a) HF > HCl > HBr > HI

(b) HCl >HF >HBr >HI (c) HBr > HCl >HF > HI (d) HI > HBr > HCl > HF

24. Shape of ClF_3 is ……(a) Linear (b) T-shape (c) Pyrimidal (d) Square planar

25. Which one of the following is more acidic? (a) HOCl (b) $HClO_2$ (c) $HClO_3$ (d) $HClO_4$

26. Shape of XeF_6 is ……(a) Octahedron (b) Distorted octahedron (c) Pyramidal (d) Tetrahedron

27. Which one of the following can penetrate through dense fog?

(a) He (b) Ne (c) Kr (d) Rn

28. Aquaregia a) 3 parts of con.HCl, one part of con.HNO_3 b) 1 part of con.HCl, 3 parts of con.HNO_3 c) 3 parts of con.HCl, one part of con.H_2SO_4 d) 1 part of con.H_2SO_4, one part of con.HNO_3

29. Shape of AX7 inter halogen compound

a) Square pyramidal b) pentagonal bipyramidal c) T shaped d) Linear

30. Structure of $XeOF_4$ a) Square pyramidal b) pentagonal bipyramidal c) T shaped d) Linear

31. Hybridisation in XeF_4 (a) sp^3d (b) sp^3d^2 (c) sp^3d^3 (d) sp^3

4. TRANSITION AND INNER TRANSITION ELEMENTS

1. Sc (Z=21) is a transition element but Zinc (z=30) is not because ……..

   (a) both Sc^{3+} and Zn^{2+} ions are colourless and form white compounds.

   (b) in case of Sc, 3d orbital are partially filled but in Zn these are completely filled

   (c) last electron as assumed to be added to 4s level in case of zinc

   (d) both Sc and Zn do not exhibit variable oxidation states

2. Which of the following d block element has half filled penultimate d sub shell as well as half filled valence sub shell? (a) Cr (b) Pd (c) Pt (d) none of these

3. Among the transition metals of 3d series, the one that has highest negative (M^{2+}/ M) standard electrode potential is ……. (a) Ti (b) Cu (c) Mn (d) Zn

4. Which one of the following ions has the same number of unpaired electrons as present in V^{3+}?

   (a) Ti^{3+} (b) Fe^{3+} (c) Ni^{2+} (d) Cr^{3+}

5. The magnetic moment of Mn^{2+} ion is …….

   (a) 5.92BM (b) 2.80BM (c) 8.95BM (d) 3.90BM

6. The catalytic behaviour of transition metals and their compounds is ascribed mainly due to

   (a) their magnetic behavior (b) their unfilled d orbitals

   (c) their ability to adopt variable oxidation states(d) their chemical reactivity

7. The correct order of increasing oxidizing power in the series …….

   (a) $VO^{+2} < Cr_2O_7^{-2} < MnO_4^-$ (b) $Cr_2O_7^{-2} < VO^{+2} < MnO_4^-$

   (c) $Cr_2O_7^{-2} < MnO_4^- < VO^{+2}$ (d) $MnO_4^- < Cr_2O_7^{-2} < VO^{+2}$

8. In acid medium, potassium permanganate oxidizes oxalic acid to …….

   (a) Oxalate (b) Carbon dioxide (c) acetate (d) acetic acid

9. Which of the following statements is not true?

   (a) on passing H_2S, through acidified $K_2Cr_2O_7$ solution, a milky colour is observed.

   (b) $Na_2Cr_2O_7$ is preferred over $K_2Cr_2O_7$ in volumetric analysis

   (c) $K_2Cr_2O_7$ solution in acidic medium is orange in colour

   (d) $K_2Cr_2O_7$ solution becomes yellow on increasing the pH beyond 7

10. Permanganate ion changes to in acidic medium ……..

(a) MnO_4^{-2} (b) Mn^{2+} (c) Mn^{3+} (d) MnO_2

11. How many moles of I_2 are liberated when 1 mole of potassium dichromate react with potassium iodide? (a) 1 (b) 2 (c) 3 (d) 4

12. The number of moles of acidified KMnO4 required to oxidize 1 mole of ferrous oxalate(FeC_2O_4) is ……. (a) 5 (b) 3 (c) 0.6 (d) 1.5

13. Which one of the following statements related to lanthanons is incorrect?

(a) Europium shows +2 oxidation state.

(b) The basicity decreases as the ionic radius decreases from Pr to Lu.

(c) All the lanthanons are much more reactive than aluminium.

(d) Ce^{4+} solutions are widely used as oxidising agents in volumetric analysis.

14. Which of the following lanthanoid ions is diamagnetic?

(a) Eu^{2+} (b) Yb^{2+} (c) Ce^{2+} (d) Sm^{2+}

15. Which of the following oxidation states is most common among the lanthanoids?

(a) 4 (b) 2 (c) 5 (d) 3

16. Assertion: Ce^{4+} is used as an oxidizing agent in volumetric analysis.

Reason: Ce^{4+} has the tendency of attaining +3 oxidation state.

(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.

17. The most common oxidation state of actinoids is (a) +2 (b) +3 (c) +4 (d) +6

18. The actinoid elements which show the highest oxidation state of +7 are ……

(a) Np, Pu, Am (b) U, Fm, Th (c) U, Th, Md (d) Es, No, Lr

19. Which one of the following is not correct?

(a) $La(OH)_2$ is less basic than $Lu(OH)_3$ (b) In lanthanoid series ionic radius of Ln^{3+} ions decreases

(c) La is actually an element of transition metal series rather than lanthanide series

(d) Atomic radii of Zr and Hf are same because of lanthanide contraction

ADDITIONAL QUESTIONS :

1. Identify the transition metal present in Hemoglobin ……..

   (a) Cobalt (b) Iron (c) Manganese (d) Copper

2. Which of the following transition metal is present in Vitamin $_{B12}$?

   (a) Cobalt (b) Platinum (c) Copper (d) Iron

3. The correct electronic configuration of Cr is ……..

   (a) [Ar] $3d^4\ 4s^2$ (b) [Ar] $3d^5$ (c) [Ar] $3d^5\ 4s^1$ (d) [Ar] $3d^6$

4. Which of the following is the correct electronic configuration of copper?

   (a) [Ar] $3d^5\ 4s^1$ (b) [Ar] $3d^{10}\ 4s^1$ (c) [Ar] $3d^9\ 4s^2$ (d) [Ar] $3d^8\ 4s^2\ 4p^1$

5. Which one of the following is the general electronic configuration of transition elements?

   (a) [Noble gas] $ns^2\ np^6$ (b) [Noble gas] (n – 2) $f^{1-14}(n\text{-}l)d^{1-10}\ ns^2$

   (c) [Noble gas] (n – 1) $d^{1-10}\ (n\text{-}l)f^{1-14}\ ns^2$ (d) [Noble gas] (n – 1) $d^{1-10}\ ns^2$

6. Which of the following d-block elements has the highest electrical conductivity at room temperature? (a) Copper (b) Silver (c) Aluminium (d) Tungsten

7. Which one of the following is diamagnetic in nature?

   (a) Ti^{3+} (b) Cu^{2+} (c) Zn^{2+} (d) V^{3+}

8. Which of the following pair has maximum number of unpaired electrons?

   (a) Mn^{2+}, Fe^{3+} (b) CO^{3+}, Fe^{2+} (c) Cr^{3+}, Mn^{4+} (d) Ti^{2+}, V^{3+}

9. Which one of the following is Zeigler – Natta catalyst?

   (a) $CO_2(CO)_8$ (b) Rh/Ir complex (c) $TiCl_4 + Al(C_2H_5)_3$ (d) Fe / Mo

10. Which one of the following is used as a catalyst in the polymerisation of propylene?

    (a) V_2O_5 (b) Pt (c) $TiCl_4 + Al(C_2H_5)_3$ (d) Fe / Mo

11. Which one of the following oxide is amphoteric in nature?

    (a) CrO (b) Cr_2O_3 (c) Mn_2O_7 (d) MnO

12. The oxidation state of Chromium in CrO_4^{-2} and in $Cr_2O_7^{-2}$ are ……..

    (a) +3, +6 (b) +7, +4 (c) +6, +6 (d) +4, +6

13. Which one of the following is the formula of chromyl chloride?

    (a) $CrOCl_2$ (b) $CrCl_3$ (c) $CrO_2\ Cl_2$ (d) CrCl

14. Which one of the following geometry is possesed by permanganate ion?

(a) Pyramidal (b) Tetrahedral (c) Octahedral (d) linear

15. Which one of the following is known as Baeyer's reagent?

(a) Cold dilute alkaline $KMnO_4$ (b) Chromyl Chloride

(c) Acidified potassium dichromate (d) Acidified potassium manganate

16. Baeyer's reagent is used to detect unsaturation in an organic compound.

(a) Chloride ion (b) unsaturated organic compound

(c) Sulphate ion (d) Chromate ion

17. Which one of the following is the main cause of lanthanoid contraction?

(a) Poor shielding effect of 5f sub-shell (b) More shielding effect of 4f sub-shell

(c) Poor shielding effect of 4f sub-shell (d) More shielding effect of 5f sub-shell

18. Which of the following pair has more or less same atomic radius due to lanthanide contraction?

(a) Ti and V (b) Fm and Md (c) No and Lr (d) Zr and Hf

19. Which one of the following is more basic in nature?

(a) $La(OH)_3$ (b) $Ce(OH)_3$ (c) $Gd(OH)_3$ (d) $Lu(OH)_3$

20. Assertion (A) -- In transition metal series, the ionization enthalpy increases.

Reason (R) – This is due to increase in nuclear charge corresponding to the filling of d electrons.

(a) Both (A) and (R) are correct and (R) explains (A).

(b) Both (A) and (R) are correct but (R) is not the correct explanation of (A).

(c) (A) is correct but (R) is wrong.

(d) (A) is wrong but (R) is correct.

21. Which one of the following elements show high negative electrode potential?

(a) Copper (b) Manganese (c) Cobalt (d) Zinc

22. Which one of the following transition element has maximum oxidation states?

(a) Manganese (b) Copper (c) Scandium (d) Titanium

5. COORDINATION CHEMISTRY

1. The sum of primary valance and secondary valance of the metal M in the complex $[M(en)_2(Ox)]Cl$ is …….. (a) 3 (b) 6 (c) -3 (d) 9

2. An excess of silver nitrate is added to 100ml of a 0.01M solution of penta aquachlorido chromium (III) chloride. The number of moles of AgCl precipitated would be ……..

(a) 0.02 (b) 0.002 (c) 0.01 (d) 0.2

3. A complex has a molecular formula $MSO_4Cl.\ 6H_2O$. The aqueous solution of it gives white precipitate with Barium chloride solution and no precipitate is obtained when it is treated with silver nitrate solution. If the secondary valence of the metal is six, which one of the following correctly represents the complex?

(a) $[M(H_2O)_4Cl]\ SO_2.\ 2H_2O$ (b) $[M(H_2O)_6]\ SO_4$

(C)$[M(H_2O)_5Cl]\ SO_4.\ H_2O$ (d) $[M(H_2O)_3Cl]\ SO_4.\ 3H_2O$

4. Oxidation state of Iron and the charge on the ligand NO in $[Fe(H_2O)_5NO]\ SO_4$ are ……..

(a) +2 and 0 respectively (b) +3 and 0 respectively

(c) +3 and -1 respectively (d) +1 and +1 respectively

5. As per IUPAC guidelines, the name of the complex $[CO(en)_2(ONO)Cl]Cl$ is ……..

(a) chlorobisethylenediaminenitritocobalt (III) chloride

(b chloridobis (ethane-1, 2-diamine) nitro k – Ocobaltate (III) chloride

(c) chloridobis (ethane-1, 2-diammine) nitrito k – Ocobalt (II) chloride

(d) chloridobis (ethane-1, 2-diamine) nitro k – Ocobalt (III) chloride

6. IUPAC name of the complex $K_3[Al(C_2O_4)_3]$ is ……..

(a) potassiumtrioxalatoaluminium (III) (b) potassiumtrioxalatoaluminate (II)

(c) potassiumtrisoxalatoaluminate (III) (d) potassiumtrioxalatoaluminate (III)

7. A magnetic moment of 1.73BM will be shown by one among the following ……..

(a) $TiCl_4$ (b) $[COCl_6]^{4-}$ (c) $[Cu(NH_3)_4]^{2+}$ (d) $[Ni(CN)_4]^{2-}$

8. Crystal field stabilization energy for high spin d5 octahedral complex is ……..

(a) $-0.6\Delta_0$ (b) 0 (c) $2\ (P - \Delta_0)$ (d) $2\ (P + \Delta_0)$

9. In which of the following coordination entities the magnitude of Δ_0 will be maximum?

(a) $[CO(CN)_6]^{3-}$ (b) $[CO(C_2O_4)_3]^{3-}$ (c) $[CO(H_2O)_6]^{3+}$ (d) $[CO(NH_3)_6]^{3+}$

10. Which one of the following will give a pair of enantiomorphs?

(a) $[Cr(NH_3)_6][CO(CN)_6]$ (b) $[CO(en)_2Cl_2]Cl$

(c) $[Pt(NH_3)_4][PtCl_4]$ (d) $[CO(NH_3)_4Cl_2]NO_2$

11. Which type of isomerism is exhibited by $[Pt(NH_3)_2Cl_2]$?

(a) Coordination isomerism (b) Linkage isomerism

(c) Optical isomerism (d) Geometrical isomerism

12. How many geometrical isomers are possible for [Pt (Py) (NH_3) (Br) (Cl)]?

(a) 3 (6) 4 (c) 0 (d) 15

13. Which one of the following pairs represents linkage isomers?

(a) $[Cu(NH_3)_4]$ $[PtCl_4]$ and $[Pt(NH_3)_4]$ $[CuCl_4]$

(b) $[CO(NH_3)_5(NO_3)]SO_4$ and $[CO(NH_3)_5(ONO)]$

(c) $[CO(NH_3)_4(NCS)_2]Cl$ and $[CO(NH_3)_4(SCN)_2]Cl$

(d) both (b) and (c)

14. Which kind of isomerism is possible for a complex $[CO(NH_3)_4Br_2]Cl$?

(a) geometrical and ionization (b) geometrical and optical

(c) optical and ionization (d) geometrical only

15. Which one of the following complexes is not expected to exhibit isomerism?

(a) $[Ni(NH_3)_4(H_2O)_2]^{2+}$ (b) $[Pt(NH_3)_2\ Cl_2]$ (C) $[CO(NH_3)_5SO_4]Cl$ (d) $[Fe(en)_3]^{3+}$

16. A complex in which the oxidation number of the metal is zero is ……..

(a) $K_4[Fe(CN)_6]$ (b) $[Fe(CN)_3(NH_3)_3]$ (c) $[Fe(CO)_5]$ (d) both (b) and (c)

17. Formula of tris (ethane-1, 2-diamine) iron (II) phosphate ……..

(a) $[Fe(CH_3 - CH(NH_2)_2)_3]$ $(PO_4)_3$ (b) $[Fe(H_2N - CH_2 - CH_2 - NH_2)_3]$ (PO_4)

(c) $[Fe(H_2N - CH_2 - CH_2 - NH_2)_3](PO_4)_2$ (d) $[Fe(H_2N - CH_2 - CH_2 - NH_2)_3](PO_4)_2$

18. Which of the following is paramagnetic in nature?

(a) $[Zn(NH_3)_4]^{2+}$ (b) $[CO(NH_3)_6]^{3+}$ (c) $[Ni(H_2O)_6]^{2+}$ (d) $[Ni(CN)_4]^{2-}$

19. Facmer isomerism is shown by …….

(a) $[CO(en)_3]^{3+}$ (b) $[CO(NH_3)_4(Cl)_2]^+$ (c) $[CO(NH_3)_3(Cl)_3]$ (d) $[CO(NH_3)_5Cl]SO_4$

20. Choose the correct statement.

(a) Square planar complexes are more stable than octahedral complexes

(b) The spin only magnetic moment of $[Cu(Cl)_4]^{2-}$ is 1.732 BM and it has square planar structure.

(c) Crystal field splitting energy (Δ_0) of $[FeF_6]^{4-}$ is higher than the (Δ_0) of $[Fe(CN)_6]^{4-}$

(d) crystal field stabilization energy of $[V(H_2O)_6]^{2+}$ is higher than the crystal field stabilization of $[Ti(H_2O)_6]^{2+}$

ADDITIONAL QUESTIONS :

1. What are primary and secondary valency of cobalt in $COCl_3.6NH_3$?

   (a) 3, 3 (b) 6, 3 (c) 3, 6 (d) 6, 6

2. Consider the following statements.

   (i) The outer sphere in coordination compound is called ionisation sphere.

   (ii) The primary valences are non directional while secondary valences are directional.

   (iii) The primary valances of a metal ion is negative and it is satisfied by positive ions.

   Which of the above statements is/are not correct?

   (a) (i) and (ii) (b) (ii) and (iii) (c) (iii) only (d) (ii) only

3. Which of the following is called Lewis acid in $[Ni(CO)_4]$?

   (a) Ni^{2+} (b) CO (c) Ni^{4+} (d) CO

4. The oxidation state of Fe in $[Fe(CN)_6]^{4-}$ is …….

   (a) II (b) III (c) VI (d) IV

5. What is the coordination number of Pt in $[Pt(NO_2)(H_2O)(NH_3)_2]Br$?

   (a) 3 (b) 4 (c) 2 (d) 5

6. Which one of the following is a homoleptic complex?

   (a) $[CO(NH_3)_3](Cl_3)]$ (b) $[Pt(NH_3)_2Cl_2]$ (c) $[Pt(NO_2)(H_2O)(NH_3)_2]Br$ (d) $[Co(NH_3)_6]Cl_3$

7. Which one of the following is called as Zeise's salt?

   (a) $[Pt(NH_3)_4]$ $[PtCl_4]$ (b) $K[PtCl_3(C_2H_4)]$ (c) $K_4[Fe(CN)_6]$ (d) $[Fe(CO)_5]$

8. $[Pt(NH_3)_4][PtCl_4]$ is called as ……..

(a) Zeigler Natta Catalyst (b) Zeises' salt (c) Magnus's green salt (d) Mohr's salt

9. The IUPAC name of $K_4[Fe(CN)_6]$ is ……..

(a) Potassium hexacyanido Ferrate (III) (b) Potassium hexacyanidoferrate (II)

(c) Potassium ferrocyanide (d) Potassium ferricyanide

10. The IUPAC name of $[CO(NH_3)_4Cl_2]Cl$ is ……..

(a) Tetrammine dichlorido cobalt (III) chloride (b) Dichlorido tetrammine cobalt (III) chloride

(c) Tetrammine cobalt (III) trichloride (d) Tetrammine dichlorido cobaltate (III)

11. The formula of Hexafluorido ferrate (II) ion is ……..

(a) $[FeF_6]^{4-}$ (b) $[FeF_6]^{3-}$ (c) $[FeF_6]^{2-}$ (d) $[FeF_6]^{3+}$

12. $[Cr(NH_3)_4ClBr]NO$, and $[Cr(NH_3)_4ClNO_2]Br$ are examples of ……..

(a) Linkage isomerism (b) Ionisation isomerism

(c) Coordination isomerism (d) Hydrate isomerism

13. Square planar complexes have type of hybridisation ……..

(a) sp^3 (b) dsp^2 (c) sp^3d (d) sp^3d^2

14. In octahedral geometry, the type of hybridisation involved is ……..

(a) sp^3d^2 (b) d^2sp^3 (c) dsp^3 (d) a or b

15. The geometry of $[Fe(CN)_6]^{3-}$ is …….. (a) Tetrahedral (b) Octahedral

(c) Square planar (d) Trigonamal bipyramidal

16. Which is used for the separation of lanthanides, in softening of hard water and also in removing lead poisoning?

(a) $[Ni(CO)_4]$ (b) EDTA (c) $[Ni(DMG)_2]$ (d) $TiCl_4 + Al(C_2H_5)_3$

17. Which complex is used as an antitumor drug in cancer treatment?

(a) Ca – EDTA chelate (b) EDTA (c) $TiCl_4 + Al(C_2H_5)_3$ (d) Cis – Platin

18. The IUPAC name of Zeise's salt is ……..

(a) Tetramminecopper (II) sulphate (b) FerrousAmmoniumsulphate

(c) Tetracyanocopper (II) Sulphate (d) Potassiumtrichloro (ethene) platinate (II)

19. The CFSE is the highest for …….

(a) $[CO\ F_4]^{2-}$ (b) $[CO\ (NCS)_4]^{2-}$ (c) $[CO\ (NH3)]^{3+}$ (d) $[CO\ Cl_4]^{2-}$

20. The hybridization involved in the complex $[Ni\ (CN)_4]^{2-}$ is …….

(a) sp^3 (b) $d^2\ sp^{3+}$ (c) dsp^2 (d) sp^3d^2

21. Assertion (A) – $[CO(NH_3)_4Br_2]Cl$ and $[CO(NH_3)_4Cl\ Br]\ Br$ are examples of ionisation isomers.

Reason (R) – The exchange of counter ions with one or more ligands in the coordination entity will result in ionisation isomers.

(a) Both A and R are correct and R is not the correct explanation of A.

(b) Both A and R are correct but R is the correct explanation of A.

(c) A and R are wrong.

(d) A is wrong but R is correct.

6. SOLID STATE

1. Graphite and diamond are ……. (a) Covalent and molecular crystals

(b) ionic and covalent (c) both covalent crystals (d) both molecular crystals

2. An ionic compound Ax By crystallizes in fee type crystal structure with B ions at the centre of each face and A ion occupying centre of the cube, the correct formula of A B is …….

(a) AB (b) AB_3 (c) A_3B (d) A_8B_6

3. The rano of close packed atoms to tetrahedral hole in cubic packing is …….

(a) 1:1 (b) 1:2 (c) 2:1 (d) 1:4

4. Solid CO_2 is an example of …….

(a) Covalent solid (b) metallic solid (c) molecular solid (d) ionic solid

5. Assertion: monoclinic sulphur is an example of monoclinic crystal system.

Reason: for a monoclinic system, $a \neq b \neq c$ and $\alpha = \gamma = 90°$, $\beta \neq 90°$.

(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.

6. In calcium fluoride, having the flurite structure the coordination number of Ca^{2+} ion and F Ion are …….(a) 4 and 2 (b) 6 and 6 (c) 8 and 4 (d) 4 and 8

7. The number of unit cells in 8gm of an element X (atomic mass 40) which crystallizes in bcc pattern is (N_A is the Avogadro number)

(a) 6.023×10^{23} (b) 6.023×10^{22} (c) 60.23×10^{23} (d) $(6.023 \times 10^{23} / (8 \times 40)$

8. In a solid atom M occupies ccp lattice and (1/3) of tetrahedral voids are occupied by atom N. Find the formula of solid formed by M and N.

(a) MN (b) M_3N (C) MN_3 (d) M_3N_2

9. The ionic radii of A^+ and B^- are 0.98×10^{-10} m and 1.81×10^{-10} m , the coordination number of each ion in AB is ……. (a) 8 (b) 2 (c) 6 (d) 4

10. CsCl has bcc arrangement, its unit cell edge length is 400pm, its inter atomic distance is …….

(a) 400pm (b) 800pm (c) √3 x 100pm (d) (√3/2) x 400 pm

11. A solid compound XY has NaCl structure, if the radius of the cation is 100pm , the radius of the anion will be ……. (a) (100/0.414) (b) (0.732/100) (c) 100 x 0.414 (d) (0.414/100)

12. The vacant space in bcc lattice unit cell is …….

(a) 48% (b) 23% (c) 32% (d) 26%

13. The radius of an atom is 300pm, if it crystallizes in a face centered cubic lattice, the length of the edge of the unit cell is …….

(a) 488.5pm (b) 848.5pm (c) 884.5pm (d) 484.5pm

14. The fraction of total volume occupied by the atoms in a simple cubic is …….

(a) (π/ 4√2) (b) (π/6) (c) (π/4) (d) (π/ √3/2)

15. The yellow colour in NaCl crystal is due to …….

(a) excitation of electrons in F centers (b) reflection of light from Cl^- ion on the surface

(c) refraction of light from Na^+ ion (d) all of the above

16. If 'a' stands for the edge length of the cubic system; sc ,bcc, and fcc. Then the ratio of radii of spheres in these systems will be respectively.

a) $\left(\frac{1}{2}a : \frac{\sqrt{3}}{2}a : \frac{\sqrt{2}}{2}a\right)$

c) $\left(\frac{1}{2}a : \frac{\sqrt{3}}{4}a : \frac{1}{2\sqrt{2}}a\right)$

(c) $\left(\frac{1}{2}a : \frac{\sqrt{3}}{4}a : \frac{1}{2\sqrt{2}}a\right)$

(d) $\left(\frac{1}{2}a : \sqrt{3}a : \frac{1}{\sqrt{2}}a\right)$

17. If a is the length of the side of the cube, the distance between the body centered atom and one comer atom in the cube will be …….

(a) (2/√3)a (b) (4/√3)a (c) (√3/4)a (d) (√3/2)a

18. Potassium has a bcc structure with nearest neighbor distance 4.52 A. its atomic weight is 39. Its density will be …….

(a) 915 kg m^{-3} (b) 2142 kg m^{-3} (c) 452 kg m^{-3} (d) 390 kg m^{-3}

19. Schottky defect in a crystal is observed when …….

(a) unequal number of anions and anions are missing from the lattice

(b) equal number of anions and anions are missing from the lattice

(e) an ion leaves its normal site and occupies an interstitial site

(d) no ion is missing from its lattice.

20. The cation leaves its normal position in the crystal and moves to some interstitial position, the defect in the crystal is known as …….

(a) Schottky defect (b) F center (c) Frenkel defect (d) non-stoichiometric defect

21. Assertion – due to Frenkel defect, density of the crystalline solid decreases.

Reason – in Frenkel defect cation and anion leaves the crystal.

(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.

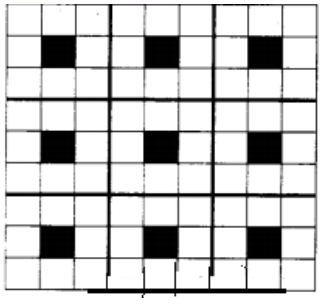
(c) Assertion is true but reason is false.

(d) Both assertion and reason are false

22. The crystal with a metal deficiency defect is …….

(a) NaCl (b) FeO (c) ZnO (a) KCl

23. A two dimensional solid pattern formed by two different atoms X and Y is shown below. The black and white squares represent atoms X and Y respectively. The simplest formula for the compound based on the unit cell from the pattern is …….



(a) XY_8 (b) X_4Y_9 (c) XY_2 (d) XY_4

ADDITIONAL QUESTIONS :

1. Which one of the following is an amorphous solid?

   (a) Glass (b) SiO_2 (c) NaCl (d) Na

2. Which one of the following is an example for molecular crystals?

   (a) Diamond (b) Silica (c) Glass (d) Naphthalene

3. Which one of the following is a covalent crystal?

   (a) Glass (b) Diamond (c) Anthracene (d) Glucose

4. In an ionic crystal, both cations and anions are bound together by …….

   (a) Strong electrostatic attractive forces (b) Weak electrostatic attractive forces

   (c) Vanderwaals forces of attraction (d) Weak cohesive forces

5. In non polar molecular solids, molecules are held together by …….

   (a) London forces (b) weak vanderwaals forces

   (c) Strong electrostatic forces (d) strong cohesive forces

6. Solid NH_3 solid CO_2 are examples of …….

   (a) Covalent solid (b) polar molecular solids (c) molecular solids (d) ionic solids

7. Each atom in the corner of the cubic unit cell is shared by how many unit cells?

   (a) 8 (b) 6 (c) 1 (d) 12

8. The number of atoms belongs to fcc unit cell is …….

   (a) 2 (b) 4 (c) 6 (d) 12

9. The atoms the face centre is being shared by …….

   (a) 4 (b) 8 (c) 2 (d) 6

10. Which is the packing fraction in simple cubic unit cell?

    (a) 52.31% (b) 100% (c) 68% (d) 75%

11. The packing fraction in bcc arrangement is …….

    (a) 52.3 1% (b) 68% (c) 100% (d) 80%

12. Which is the coordination number in both hep and ccp arrangements?

    (a) 12 (b) 6 (c) 4 (d) 8

13. The coordination number of zinc sulphide is …….

(a) 3 (b) 4 (c) 6 (d) 8

14. Which one of the following is the coordination number of NaCl?

(a) 3 (b) 4 (c) 6 (d) 8

15. Which one of the following is an example for Frenkel defect?

(a) NaCl (b) AgCl (c) AgBr (d) $AgNO_3$

16. Which one of the following is the metal deficiency defect?

(a) FeO (b) ZnO (c) KCl (d) NaCl

17. Which one of the following shows non- stoichiometric defect?

(a) FeO (b) AgBr (c) ZnO (d) Both a and c

18. Which one of the following is the packing efficiency in fcc unit cell?

(a) 74% (b) 52.6 1% (c) 100% (d) 68%

19. The coordination number of CSCI ¡s …….

(a) 3 (b) 4 (c) 6 (d) 8

20. Which one of the following formula is used to calculate the density of the unit cell ?

(a) $\rho = nMa^3/N_A$ (b) $\rho = a^3N_A/ nM$ (c) $\rho = N_Aa^3/ NM$ (d) $\rho = a^3NAn$

21. Which one of the following is known as Bragg's equation'?

(a) $d = 2\sin\theta n\lambda$ (b) $d = n\lambda 2\sin\theta$ (c) $d = d\sin\theta$ (d) $d = 2\sin\theta n\lambda$

22. Naphthalene is an example of ……. (a) ionic solid

(b) covalent solid (c) non polar molecular solid (d) polar molecular solid

7. CHEMICAL KINETICS

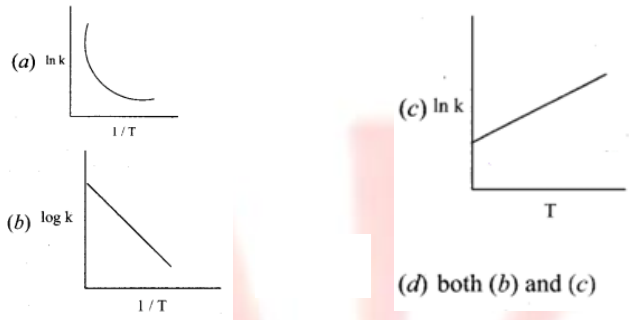
1. For a first order reaction A → B the rate constant is x min-1. If the initial concentration of A is 0.01 M, the concentration of A after one hour is given by the expression.

(a) $0.01\ e^{-x}$ (b) $1 \times 10^{-2}\ (1 - e^{-60x})$ (c) $(1 \times 10^{-2})\ e^{-60x}$ (d) none of these

2. A zero order reaction X → Product, with an initial concentration 0.02M has a half life of 10 min. If one starts with concentration 0.04M, then the half life is …….

(a) 10 s (b) 5 min (c) 20 min (d) cannot be predicted using the given information

3. Among the following graphs showing variation of rate constant with temperature (T) for a reaction, the one that exhibits Arrhenius behavior over the entire temperature range is ……



(d) both (b) and (c)

4. For a first order react ion A → product with initial concentration x mol L^{-1}, has a half life period of 2.5 hours. For the same reaction with initial concentration mol L^{-1} the half life is

(a) (2.5 x 2) hours (b) (2.5/2) hours (c) 2.5 hours

(d) Without knowing the rate constant, $t_{1/2}$ cannot be determined from the given data

5. For the reaction, $2NH_3 \rightarrow N_2 + 3H_2$, if

$$\frac{-d[NH_3]}{dt} = k_1[NH_3],\ \frac{d[N_2]}{dt} = k_2[NH_3],\ \frac{d[H_2]}{dt} = k_3[NH_3]$$

then the relation between k1, k2 and k3 is

(a) k1 = k2 = k3 (b) k1 = 3 k2 = 2 k3 (c) 1.5k1 = 3 k2 = k3 (d) 2k1 = k2 = 3 k3

6. The decomposition of phosphine (PH3) on tungsten at low pressure is a first order reaction. It is because the …….

(a) rate is proportional to the surface coverage

(b) rate is inversely proportional to the surface coverage

(c) rate is independent of the surface coverage

(d) rate of decomposition is slow

7. For a reaction Rate = k [acetone]3/2 then unit of rate constant and rate of reaction respectively is

(a) (mol L^{-1} s^{-1}), (mol$^{-1/2}$ $L^{1/2}$ s^{-1}) (b) (mol$^{-1/2}$ $L^{1/2}$ s^{-1}), (mol L^{-1} s^{-1})

(c) (mol$^{1/2}$ $L^{1/2}$ s^{-1}), (mol L^{-1} s^{-1}) (d) (mol L s^{-1}), (mol$^{1/2}$ $L^{1/2}$ s)

8. The addition of a catalyst during a chemical reaction alters which of the following quantities?

(a) Enthalpy (b) Activation energy (c) Entropy (d) Internal energy

9. Consider the following statements:

(i) increase in concentration of the reactant increases the rate of a zero order reaction.

(ii) rate constant k is equal to collision frequency A if Ea = o

(iii) rate constant k is equal to collision frequency A if Ea = o

(iv) a plot of ln (k) vs T is a straight line.

(v) a plot of In (k) vs (1T) is a straight line with a positive slope.

Correct statements are

(a) (ii) only (b) (ii) and (iv) (c) (ii) and (v) (d) (i), (ii) and (v)

10. In a reversible reaction, the enthalpy change and the activation energy in the forward direction are respectively – x kJ mol^{-1} and y kJ mol^{-1}. Therefore, the energy of activation in the backward direction is …….

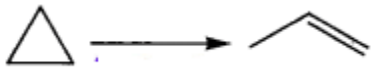
(a) (v – x)kJ mol^{-1} (b) (x + y) J mol^{-1} (c) (x – y) kJ mol^{-1} (d) (x + y) x 103 J mol^{-1}

11. What is the activation energy for a reaction if its rate doubles when the temperature is raised from 200K to 400K? (R 8.314 JK^{-1} mol^{-1})

(a) 234.65 kJ mol^{-1} K^{-1} (b) 434.65 kJ mol^{-1} K^{-1}

(c) 434.65 J mol^{-1} K^{-1} (d) 334.65 J mol^{-1} K^{-1}

12.



This reaction follows first order kinetics. The rate constant at particular temperature is 2.303 x 10^{-2} hours. The initial concentration of cyclopropane is 0.25 M. What will be the concentration of cyclopropane after 1806 minutes? (Log 2 = 0.30 10)

(a) 0.125 M (b) 0.215 M (c) 0.25 x 2.303 M (d) 0.05 M

13. For a first order reaction, the rate constant is 6.909 min^{-1}.The time taken for 75% conversion in minutes is …… (a) (32) log 2 (b) (32) log 2 (c) (32) log (3 (d) (23) log (43)

14. In a first order reaction x → y; if k is the rate constant and the initial concentration of the reactant x is 0.1 M, then, the half life is ……..

(a) (log2k) (b) (0.693(0.1)k) (c) (In2k) (d) none of these

15. Predict the rate law of the following reaction based on the data given below:

$2A + B \rightarrow C + 3D$

Reaction number	[A] (min)	[B] (min)	Initial rate ($M\ s^{-1}$)
1	0.1	0.1	x
2	0.2	0.1	$2x$
3	0.1	0.2	$4x$
4	0.2	0.2	$8x$

(a) rate = $k [A]^2 [B]$

(b) rate = $k [A][B]^2$

(c) rate = $k [A][B]$

(d) rate = $k [A]^{1/2} [B]^{3/2}$

16. Assertion: rate of reaction doubles when the concentration of the reactant is doubles if it is a first order reaction.

Reason: rate constant also doubles

(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.

17. The rate constant of a reaction is $5.8 \times 10^{-2}\ s^{-1}$. The order of the reaction is .....

(a) First order (b) zero order (c) Second order (a) Third order

18. For the reaction $N_2O_5(g) \rightarrow 2NO_2(g) + 1/2\ O_2(g)$ the value of rate of disappearance of N_2O_5 is given as 6.5 x 10-2 mol $L^{-1}s^{-1}$ The rate of formation of NO_2 and O_2 is given respectively as

(a) (3.25×10^{-2} mol $L^{-1}s^{-1}$) and (1.3×10^{-2} mol $L^{-1}s^{-1}$)

(b) (1.3×10^{-2} mol $L^{-1}s^{-1}$) and (3.25×10^{2} mol $L^{-1}s^{-1}$)

(c) (1.3×10^{-1} mol $L^{-1}s^{-1}$) and (3.25×10^{-2} mol $L^{-1}s^{-1}$)

(d) None of these

19. During the decomposition of H_2O_2 to give dioxygen, 48g O_2 is formed per minute at certain point of time. The rate of formation of water at this point is .....

(a) 0.75 mol min^{-1} (b) 1.5 mol min^{-1} (c) 2.25 mol min^{-1} (d) 3.0 mol min^{-1}

20. If the initial concentration of the reactant is doubled, the time for half reaction is also doubled. Then the order of the reaction is .....

(a) Zero (b) one (c) Fraction (d) none

21. In a homogeneous reaction A ? B + C + D, the initial pressure was P0 and after time t it was P. Expression for rate constant in terms of P0, P and t will be …….

a) $k = \left(\frac{2.303}{t}\right)\log\left(\frac{2P_0}{3P_0 - P}\right)$

b) $k = \left(\frac{2.303}{t}\right)\log\left(\frac{2P_0}{P_0 - P}\right)$

c) $k = \left(\frac{2.303}{t}\right)\log\left(\frac{3P_0 - P}{2P_0}\right)$

d) $k = \left(\frac{2.303}{t}\right)\log\left(\frac{2P_0}{3P_0 - 2P}\right)$

22. If 75% of a first order reaction was completed in 60 minutes, 50% of the same reaction under the same conditions would be completed in ……

(a) 20 minutes (b) 30 minutes (c) 35 minutes (d) 75 minutes

23. The half life period of a radioactive element is 140 days. After 560 days, 1 g of element will be reduced to (a) 12 g (b) 14 g (c) 18 g (d) 116 g

24. The correct difference between first and second order reactions is that ……

(a) A first order reaction can be catalysed a second order reaction cannot be catalysed.

(b) The half life of a first order reaction does not depend on [A0] the half life of a second order reaction does depend on [A0].

(c) The rate of a first order reaction does not depend on reactant concentrations; the rate of a second order reaction does depend on reactant concentrations.

(d) The rate of a first order reaction does depend on reactant concentrations; the rate of a second order reaction does not depend on reactant concentrations,

25. After 2 hours, a radioactive substance becomes (116)th of original amount. Then the half life (in mm) is ……

(a) 60 minutes (b) 120 minutes (c) 30 minutes (d) 15 minutes

ADDITIONAL QUESTIONS :

1. Which one of the following is the unit of rate of reaction?

   (a) s^{-1} (b) mol s^{-1} (c) mol L^{-1} s^{-1} (d) mol L s

2. Which of the following is the order of decomposition of hydrogen peroxide catalysed by I^-

   (a) First order (b) Second order (c) Zero order (a) Third order

3. Which one of the following is the unit of rate constant for a first order reaction?

   (a) mol^{-1} L s^{-1} (b) mol L^{-1} s^{-1} (c) s^{-1} (d) mol L S

4. What is the order of isomerisation of cyclopropane to propene?

   (a) 1.5 (b) 3/2 (c) 5/2 (d) 1

5. Which one of the following is called pseudo first order reaction?

   (a) Decomposition of acetaldehyde (b) Acid hydrolysis of an ester

   (c) Isomerisation of cyclopropane to propene (d) Decomposition of hydrogen peroxide

6. The half life period of first order reaction is 10 seconds. What is the time required for 99.9% completion of that reaction?

   (a) 20 seconds (b) 1000 seconds (c) 100 seconds (d) 999 seconds

7. Which one of the following does not affect the rate of the reaction?

   (a) Nature of the reactant (b) Concentration of the reactants

   (c) Surface area and temperature (d) pressure

8. What is the order of radioactive decay?

   (a) first order (b) zero order (c) second order (d) third order

9. $t_{1/2}$ of the reaction increases with increase in initial concentration of the reaction means the order of the reaction will be ……

   (a) first order (b) zero order (c) second order (d) third order

10. Identify the reaction order if the unit of rate constant is s^{-1} …….

    (a) zero order reaction (b) second order reaction

    (c) first order reaction (d) third order reaction

11. What is unit of zero order reaction?

    (a) s^{-1} (b) mol^{-1} L^{-1} s^{-1} (c) mol L^{-1} s^{-1} (d) mol L s^{-1}

12. Polymerisation reactions follows ……. order kinetics.

(a) fractional (b) first (c) zero (d) Pseudo first

13. Activation energy of a chemical reaction can be determined by …….

(a) changing concentration of the reactants

(b) Evaluating rate constants at standard temperature

(c) Evaluating rate constants at two different temperature

(d) Evaluating reIocities of reaction at two different temperature

14. A large increase in the rate of a reaction for a rise in temperature is due to ……

(a) the decrease in the number of collisions

(b) increase in the number of activated molecules

(c) the shortening of mean free path

(d) the lowering of activation energy

15. The minimum energy of a molecule would possess in order to enter into a fruitful collision is known as (a) Reaction energy (b) collision energy (c) Activation energy (d) Threshold energy

16. Assertion (A): Powdered calcium carbonate reacts much faster with dilute HCL than with the same mass of $CaCO_3$ as marble.

Reason (R): For a given mass of a reactant, when the particle size decreases, surface area increases. Increase in surface area of the reactant leads to more collisions per litre per second and hence the rate of the reaction also increases.

(a) Both A and R are correct and R is the correct explanation of A.

(b) Both A and R arc correct but R is not correct explanation of A

(c) A is correct but R is wrong (d) A is wrong but R is correct

17. Assertion (A): Order of the reaction can be zero or fractional

Reason (R): We cannot determine order from balanced chemical equation

(a) Both A and R are correct but R is not correct explanation of A.

(b) Both A and R are correct and R is the correct explanation of A

(c) A is correct but R is wrong

(d) A is wrong but R is correct

18. Assertion (A): If the activation enery of a reaction is zero, temperature will have no effect on the rate constant

Reason (R): Lower the activation energy, faster is the reaction.

(a) Both A and R are correct and R is the correct explanation of A.

(b) Both A and R are correct but R is not correct explanation of A

(c) A is correct but R is wrong

(d) A is wrong but R is correct

ANSWER KEY

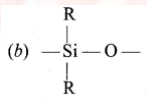
1. METALLURGY

1. b) $Al_2O_3.nH_2O$
2. c)SO_2
3. c) $MgCO_3 \rightarrow MgO + CO_2$
4. b) Al_2O_3
5. a) Al
6. d) Carbon and hydrogen are suitable reducing agents for metal sulphides
7. c) A – (iv) , B – (ii) , C – (iii) , D – (i)
8. d) Electromagnetic separation
9. b) $Cu(s) + Zn^{2+}(aq) \rightarrow Zn(s) + Cu^{2+}(aq)$
10. c) Sodium
11. b) Infusible impurities to soluble impurities
12. c) Galena
13. a) Lower the melting point of alumina
14. a) Carbon reduction
15. c) Displacement with zinc
16. c) Mg
17. b) van Arkel process
18. d) Both (a) and (c)
19. d) In the metallurgy of gold, the metal is leached with dilute sodium chloride solution
20. b) Impure copper
21. c) $\Delta G^o/\Delta T$ is negative
22. b) ΔG^o Vs T
23. b) $Al_2O_3 + 2Cr \rightarrow Cr_2O_3 + 2Al$
24. b) The graph for the formation of CO_2 is a straight line almost parallel to free energy axis.

ADDITIONAL QUESTONS

1. b) Zn
2. d) Malachite
3. c) Zone refining
4. c)Copper (I)sulphide (Cu_2S)
5. c) froth flotation
6. d) fractional crystallization
7. b)roasting
8. b) $CuCO_3Cu(OH)_2$
9. a)ZnS
10. c) Sulphur
11. a) $\Delta G^o = -nFE^o$
12. d) Flux
13. c) Sulphide
14. c) Smelting
15. a)Carbon blocks
16. a) Collector
17. c) Leaching
18. d) Magnetic separation
19. d) Calcination
20. b) Liquation
21. b) Zinc oxide
22. b) Chrome steel
23. c) both (a) and (b)
24. b) $Na_2[Zn(CN)_4]$
25. a) NaCN
26. c) acid leaching

2. P BLOCK ELEMENTS – I

1. (c) basic.
2. (d) accepts OH^- from water, releasing proton
3. (a) B_2H_6
4. (a) Aluminium
5. (c) four
6. (c) Lead
7. (c) sp^2 hybridised
8. (a) +4
9. (d) $(SiO_4)^{4-}$
10. 

(b)
11. (a) Me_3SiCl
12. (a) dry ice
13. (a) Tetrahedral

14. (d) Feldspar is a three dimensional silicate
15. (a) A – 2, B – 1, C – 4, D – 3
16. (d) Al, Cu, Mn, Mg
17. (a) Metal borides
18. (a) Al < Ga < In < Tl

ADDITIONAL QUESTONS

1. (c) -1
2. (d) ns2np6
3. (b) stable electronic configuration
4. (b) stable electronic configuration
5. (a) Fluorine
6. (b) allotropism
7. (c) 6
8. (c) borax
9. (a) diborane
10. (c) Sodium borate
11. (a) 10B5
12. (a) H3BO3
13. (d) B3N3H6
14. (c) Borazole
15. (d) (i) and (ii)
16. (b) hexagonal
17. (b) producer gas
18. (b) CO + H2
19. (c)31°C
20. (c) Neso silicates
21. (b) Beryl
22. (a) Zeolite
23. (c) Quartz

3. p-Block Elements – II

1. (a) Nessler's reagent
2. (d) ability to form pπ – pπ bonds with itself
3. (d) 1s22s22p63s23p3
4. (b) P4(white) and PH3
5. (a) H3PO3
6. (a) H3PO3
7. (b) 2
8. (a) 6N
9. (d) Both assertion and reason are false. The converse is true.
10. (b) F2
11. (b) HF > HCl > HBr > HI
12. (d) NeF2
13. (c) He
14. (c) XeO3
15. (a) HI
16. (d) Cl2 > Br2 > F2 > I2
17. (d) HClO < HClO2 < HClO3 < HClO4
18. (c) CU(NO3)2 and NO2

ADDITIONAL QUESTONS

1. (b) Fractional distillation
2. (a) Liq N2
3. (a) 10-30
4. (d) 107°
5. (c) Pyramidal
6. (a) Ostwald's process
7. (c) Nitronium ion
8. (a) AgNO3
9. (b) Firearms
10. (a) phosphorescence
11. (c) Phosphine
12. (d) sp3
13. (c) Calcium carbide + calcium phosphide
14. (c) bent shape
15. (c) 2.2 times
16. (b) Lead chamber process
17. (c) V2O5
18. (a) Cl2
19. (b) Cu2Cl2
20. (b) CaOCl2
21. (a) HF
22. (c) HF
23. (d) HI > HBr > HCl > HF
24. (b) T-shape
25. (d) HClO4
26. (b) Distorted octahedron
27. (c) Kr
28. a) 3 parts of con.HCL, one part of con.HNO3
29. b) pentagonal bipyramidal
30. a) Square pyramidal
31. (d) sp3

4. Transition and Inner Transition Elements

1. (c) in case of Sc, 3d orbital are partially filled but in Zn these are completely filled
2. (a) Cr
3. (a) Ti
4. (c) Ni2+
5. (a) 5.92BM
6. (c) their ability to adopt variable oxidation states
7. VO+2 < Cr2O2−7 < MnO–4
8. (b)Carbondioxide
9. (b) Na2Cr2O7 is preferred over K2Cr2O7 in volumetric analysis
10. (b) Mn2+
11. (c) 3
12. (c) 0.6
13. (c) All the lanthanons are much more reactive than aluminium
14. (6) Yb2+
15. (d) 3
16. (a) Both assertion and reason are true and reason is the correct explanation of assertion.
17. (c) +4
18. (a) Np, Pu, Am
19. (a) La(OH)2 is less basic than Lu(OH)3

ADDITIONAL QUESTONS

1. (b) Iron
2. (a) Cobalt
3. (c) [Ar] 3d5 4s1
4. (b) [Ar] 3d10 4s1

5. (d) [Noble gas] (n – 1) d1-10 ns2
6. (b) Silver
7. (c) Zn2+
8. (a) Mn2+, Fe3+
9. (c) TiCl4 + Al(C2H5)3
10. (c)TiCl4 + Al(C2H5)3
11. (b) Cr2O3
12. (c) +6, +6
13. (c) CrO2 Cl2
14. (b) Tetrahedral
15. (a) Cold dilute alkaline KMnO4
16. (b) unsaturated organic compound
17. (c) Poor shielding effect of 4f sub-shell
18. (d) Zr and Hf
19. (a) La(OH)3
20. (a) Both (A) and (R) are correct and (R) explains (A).
21. (d) Zinc
22. (a) Manganese

5. Coordination Chemistry

1. (d) 9
2. (b) 0.002
3. (c) [M(H2O)5Cl]SO4. H2O
4. (d) +1 and +1 respectively
5. (d) chloridobis (ethane-1, 2-diamine) nitro k – Ocobalt (III) chloride
6. (d) potassiumtrioxalatoaluminate (III)
7. (c) [Cu(NH3)4]2+
8. (b) 0
9. (a) [CO(CN)6]3-
10. (b) [CO(en)2Cl2]Cl
11. (d) Geometrical isomerism
12. (a) 3
13. (c) [CO(NH3)4(NCS)2]Cl and [CO(NH3)4(SCN)2]Cl
14. (a) geometrical and ionization
15. (d) [Fe(en)3]3+
16. (c) [Fe(CO)5]
17. (d) [Fe(H2N – CH2 – CH2 – NH2)3](PO4)2
18. (c) [Ni(H2O)6]2+
19. (c) [CO(NH3)3(Cl)3]
20. (d) crystal field stabilization energy of [V(H2O)6]2+ is is higher than the crystal field stabilization of [Ti(H2O)6]2+

ADDITIONAL QUESTONS

1. (c) 3, 6
2. (c) (iii) only
3. (a) Ni2+
4. (a) II
5. (b) 4
6. (d) [Co (NH3)6]Cl3
7. (b) K[PtCl3(C2H4)]
8. (c) Magnus's green salt
9. (b) Potassium hexa cyanido Ferrate (II)
10. (a) Tetramminedichloridocobalt (III) chloride
11. (a) [Fe F6]4-
12. (b) Ionisation isomerism
13. (b) dsp2
14. (d) a or b
15. (b) Octahedral
16. (b) EDTA
17. (d) Cis – Platin
18. (d) Potassiumtrichloro (ethene) platinate(II)
19. (d) [CO Cl4]2-
20. (c) dsp2
21. (b) Both A and R are correct and R is the correct explanation of A.

6. Solid State

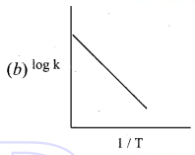
1. (c) both covalent crystals
2. (b) AB3
3. (b) 1:2
4. (c) molecular solid
5. (a) Both assertion and reason are true and reason is the correct explanation of assertion
6. (c) 8 and 4
7. (b) 6.023 x 1022
8. (d) M3N2
9. (c) 6
10. (d) (3√2) x 400 pm
11. (a) (1000.414)
12. (c) 32%
13. (b) 848.5pm
14. (b) (π6)
15. (a) excitation of electrons in F centers
16. $(c)\ \left(\frac{1}{2}a : \frac{\sqrt{3}}{4}a : \frac{1}{2\sqrt{2}}a\right)$
17. (d) (3√2)a
18. (a) 915 kg m-3
19. (b) equal number of anions and anions are missing from the lattice
20. (c) Frenkel defect
21. (d) Both assertion and reason are false
22. (b) FeO
23. (a) XY8

ADDITIONAL QUESTONS

1. (a) Glass
2. (d) Naphthalene
3. (b) Diamond
4. (a) Strong electrostatic attractive forces
5. (a) London forces
6. (b) polar molecular solids
7. (a) 8
8. (a) 2
9. (c) 2
10. (a) 52.3 1%

11. (b) 68%
12. (a) 12
13. (b) 4
14. (c) 6
15. (c) AgBr
16. (a) FeO
17. (d) Both a and c
18. (a) 74%
19. (d) 8
20. (a) ρ = nm / a3NA
21. (b) d = nλ / 2sinθ
22. (c) non polar molecular solid

7. Chemical Kinetics

1. (c) (1 x 10-2) e-60x
2. (c) 20 min
3. 

4. (d) Without knowing the rate constant, t1/2 cannot be determined from the given data
5. (c) 1.5k1 = 3 k2 = k3
6. (c) rate is independent of the surface coverage
7. (b) (mol1/2 L1/2 s-1), (mol L-1 s-1)
8. (b) Activation energy
9. (a) (ii) only
10. (d) $(a)\ k = \left(\frac{2.303}{t}\right)\log\left(\frac{2P_0}{3P_0 - P}\right)$
(x + y) x 103 J mol-1
11. (c)434.65 J mol-1 K-1
12. (b) 0.2 15 M
13. (b) (32) log 2
14. (c) (In2k)
15. (b) rate = k [A][B]2
16. (c) Assertion is true but reason is false
17. (a) First order
18. (c) (1.3 x 10-1 mol L-1s-1) and (3.25 x 10-2 mol L-1s-1)
19. (d) 3.0 mol min-1
20. (a) Zero
21. (b) 30 minutes
22. (d) 116 g
23. (b) The half life of a first order reaction does not depend on [A0]; the half life of a second order reaction does depend on [A0]
24. (c) 30 minutes

ADDITIONAL QUESTONS

1. (c) mol L-1 s-1
2. (a) First order
3. (c) s-1
4. (d) 1
5. (b) Acid hydrolysis of an ester
6. (c) loo seconds
7. (d) pressure
8. (a) first order
9. (b) zero order
10. (c) first order reaction
11. (c) mol L-1 s-1
12. (a) fractional
13. (c) Evaluating rate constants at two different temperature
14. (b) increase in the number of activated molecules
15. (a) Threshold energy
16. (a) Both A and R are correct and R is the correct explanation of A.
17. (a) Both A and R are correct and R is not correct explanation of A
18. (b) Both A and R are correct but R is not correct explanation of A

----ALL THE BEST----

Note:

- ✓ I hope this material will be useful for practice the evaluation and additional MCQ with the help of teachers.
- ✓ It will be better to give importance to the evaluation part questions then can study additional questions.
- ✓ Above average students should study text book well for creative questions
- ✓ If any mistakes or your suggestions, please send your valuable thoughts to that email to help the students
- ✓ It has been updated on January 2021

DEDICATED TO : ALL THE TEACHERS AND STUDENTS

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☞ நல்லவை நாடி(Nallavai Nadi)

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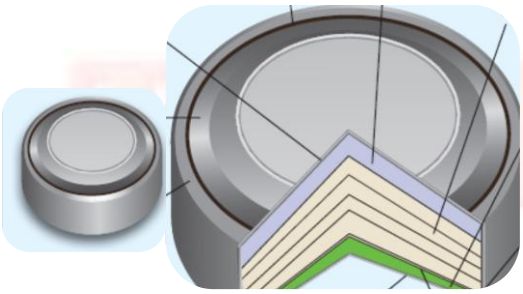
"ALL THE BEST"

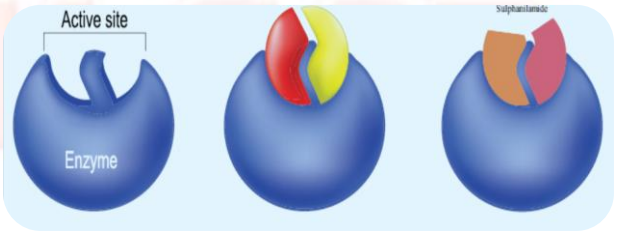
XII - Chemistry

Volume - II

UNITWISE

EVALUATION and ADDITIONAL ONE MARK QUESTIONS with ANSWER KEY





CONTENTS

8. IONIC EQUILIBRIUM

Choose the correct answer:

1. Concentration of the Ag^+ ions in a saturated solution of $Ag_2C_2O_4$ is $2.24 \times 10^{-4} mol\ L^{-1}$ solubility product of $Ag_2C_2O_4$ is

a) $2.42 \times 10^{-8} mol^3L^{-3}$ b) $2.66 \times 10^{-12} mol^3L^{-3}$

c) $4.5 \times 10^{-11} mol^3L^{-3}$ d) $5.619 \times 10^{-12} mol^3L^{-3}$

2. Following solutions were prepared by mixing different volumes of NaOH of HCl different concentrations.

i. 60 mL M/10 HCl + 40mL M/10 NaOH

ii. 55 mL M/10 HCl + 45 mL M/10 NaOH

iii. 75 mL M/5 HCl + 25mL M/5 NaOH

iv. 100 mL M/10 HCl + 100 mL M/10 NaOH

pH of which one of them will be equal to 1? a) iv b) i c) ii d) iii

3. The solubility of $BaSO_4$ in water is $2.42 \times 10^{-3} gL^{-1}$ at 298K. The value of its solubility product K_{sp} will be (NEET -2018). (Given molar mass of $BaSO_4$ =233g mol^{-1})

a) $1.08 \times 10^{-14} mol^2L^{-2}$ b) $1.08 \times 10^{-12} mol^2L^{-2}$

c) $1.08 \times 10^{-10} mol^2L^{-2}$ d) $1.08 \times 10^{-8} mol^2L^{-2}$

4. pH of a saturated solution of $Ca(OH)_2$ is 9. The Solubility product of $Ca(OH)_2$

a) 0.5×10^{-15} b) 0.25×10^{-10} c) 0.125×10^{-15} d) 0.5×10^{-10}

5. Conjugate base for bronsted acids H O 2 and HF are

a) OH^- and $H_2\ FH^+$, respectively b) H_3O^+ and F^- , respectively

c) OH^- and F^- , respectively d) H_3O^+ and H_2F^+ , respectively

6. Which will make basic buffer?

a) 50 mL of 0.1M NaOH+25mL of 0.1M CH_3COOH

b) 100 mL of 0.1M CH_3 COOH+100 mL of 0.1M NH_4OH

c) 100 mL of 0.1M HCl+200 mL of 0.1M NH_4OH

d) 100 mL of 0.1M HCl+100 mL of 0.1M NaOH

7. Which of the following fluro – compounds is most likely to behave as a Lewis base?

a) BF_3 b) PF_3 C) CF_4 d) SiF_4

8. Which of these is not likely to act as lewis base? a) BF_3 b) PF_3 C) CO d) F^-

9. The aqueous solutions of sodium formate, anilinium chloride and potassium cyanide are Respectively a) acidic, acidic, basic b) basic, acidic, basic c) basic, neutral, basic d) none of these

10. The percentage of pyridine (C_5H_5N) that forms pyridinium ion (C_5H_5NH) in a 0.10M aqueous pyridine solution K_b for $C_5H_5N = 1.7 \times 10^{-9}$) is

a) 0.006% b) 0.013% c) 0.77% d) 1.6%

11. Equal volumes of three acid solutions of pH 1,2 and 3 are mixed in a vessel. What will be the H^+ ion concentration in the mixture?

a) 3.7×10^{-2} b) 10^{-6} c) 0.111 d) none of these

12. The solubility of AgCl (s) with solubility product 1.6×10^{-10} in 0.1M NaCl solution would be

a) 1.26×10^{-5}M b) 1.6×10^{-9}M c) 1.6×10^{-11}M d) Zero

13. If the solubility product of lead iodide is 3.2 ×10-8 , its solubility will be

a) 2×10^{-3}M b) 4×10^{-4}M c) 1.6×10^{-5}M d) 1.8×10^{-5}M

14. MY and NY_3 , are insoluble salts and have the same Ksp values of 6.2×10^{-13} at room temperature. Which statement would be true with regard to MY and NY_3 ?

a) The salts MY and NY_3 are more soluble in 0.5M KY than in pure water

b) The addition of the salt of KY to the suspension of MY and NY_3 will have no effect on their solubility's

c) The molar solubilities of MY and NY_3 in water are identical

d) The molar solubility of MY in water is less than that of NY_3

15. What is the pH of the resulting solution when equal volumes of 0.1M NaOH and 0.01M HCl are mixed? a) 2.0 b) 3 c) 7.0 d) 12.65

16. The dissociation constant of a weak acid is 1×10^{-3} . In order to prepare a buffer solution with a pH = 4, the [Acid] / [Salt] ratio should be a) 4:3 b) 3:4 c) 10:1 d) 1:10

17. The pH of 10^{-5}M KOH solution will be

a) 9 b) 5 c) 19 d) none of these

18. $H_2 PO_4^-$ - the conjugate base of

a) PO_4^{3-} b) P_2O_5 c) $H_3 PO_4$ d) HPO_4^{2-}

19. Which of the following can act as lowery – Bronsted acid well as base?

a) HCl b) $SO4^{2-}$ c) HPO_4^{2-} d) Br-

20. The pH of an aqueous solution is Zero. The solution is

a) slightly acidic b) strongly acidic c) neutral d) basic

21. The hydrogen ion concentration of a buffer solution consisting of a weak acid and its salts is given by

a) $[H]^+ = K_a$ [acid] / [salt] b) $[H^+] = K_a$ [salt] c) $[H^+] = K_a$ [acid] d) $[H^=] = K^a$ [salt] / [acid]

22. Which of the following relation is correct for degree of hydrolysis of ammonium acetate? a) $h = (K_h/C)^{½}$ b) $h = (K_a/K_b)^{½}$ c) $h = (K_h/K_a\ K_b)^{½}$ d) $h = (K_a\ K_b / K_h)^{½}$

23. Dissociation constant of NH_4 OH is 1.8×10^{-5} the hydrolysis constant of NH_4Cl would be

a) 1.8×10^{-19} b) 5.55×10^{-10} c) 5.55×10^{-5} d) 1.80×10^{-5}

ADDITIONAL QUESTIONS:

1. Which of the following is present in an antacid tablet?

(a) NaOH (b) $Mg(OH)_2$ (c) $Al(OH)_3$ (d) either (b) or (c)

2. Which of the following can act as an acid as well as base by Lowry – Bronsted theory?

(a) H_2O (b) NH_3 (c) NH_4OH (d) $Ca(OH)_2$

3. In the reaction $HCl + H_2O \rightleftharpoons H_3O + Cl^-$ which one of the acid-base pair?

(a) $HCl + H_3O^+$ (b) $HCl + Cl^-$ (c) $H_3O + Cl$ (d) $H_2O + Cl^-$

4. In $[Cr(H_2O)_6]^{3+}$ which one of the following acts as Lewis acid?

(a) Cr (b) Cr^{3+} (c) $(HO)_6$ (d) Cr^{3-}

5. The value of ionic product of water at 25°C is …….

(a) 1×10^{-7} (b) 1×10^{7} (c) 1×10^{-14} (d) 1×10^{14}

6. The pH of 0.001 M HCl solution is ……

(a) 3 (b) 2 (c) 1 (d) 11

7. Which of the following is not a buffer solution?

(a) $CH_3COOH + CH_3COONa$ (b) $NH_4OH + NH_4Cl$ (c) $H_2CO_3 + NaHCO_3$ (d) $NaOH + NaCl$

8. The conjugate base of H_2O and H_2SO_4 are …….

(a) OH^- and HSO_4 (b) H_4O and SO_4^{2-} (c) OH and SO_4^{2-} (d) H_3O and HSO_4

9. The dissociation constant of a weak acid is 1.0×10^{-10}. The equilibrium constant for the reaction with strong base is (a) 1.0×10^{-5} (b) 1.0×10^{-9} (c) 1.0×10^{9} (d) 1.0×10^{14}

10. The pH of a solution at 25°C containing 0.10 M sodium acetate and 0.03 M acetic acid is ……. (pK_a for CH_3COOH = 4.57) (a) 4.09 (b) 5.09 (c) 6.10 (d) 7.09

11. A weak acid is 0.1% ionised in 0.1 M solution. Its pH is …….

(a) 2 (b) 3 (c) 4 (d) 1

12. The pH of pure water or neutral solution at 50°C is …… (pK_w = 13.2613 at 50°C)

(a) 7.0 (b) 7.13 (c) 6.0 (d) 6.63

13. What is the pH of 1 M CH_3COOH solution?. Ka of acetic acid is 1.8×10^{-5}. K = 10^{-14} mol^2 $litre^2$.

(a) 9.4 (b) 4.8 (c) 3.6 (d) 2.4

14. The pH of 0.001 M NaOH will be ……(a) 3 (b) 2 (c) 11 (d) 12

15. When solid potassium cyanide is added in water then ……

(a) pH will increase (b) pH will decrease

(c) pH will remain the same (d) electrical conductivity will not change

16. pH of a solution is 5. Its hydroxyl ion concentration is …….

(a) 5 (b) 10 (c) 10^{-5} (d) 10^{-9}

17. Which one of the following is a buffer?

(a) $CH_3COOH + CH_3COONa$ (b) $CH_3COOH + CH_3COONH_4$

(c) $NaOH + NaCl$ (d) $CH_3COOH + NH_4Cl$

18. By adding a strong acid to the buffer solution, the pH of the buffer solution ……..

(a) remains constant (b) increases (c) decreases (d) becomes zero

19. The unit of ionic product of water K is ……

(a) mol^{-1} L^{-1} (b) mol^{-2} L^{-2} (c) mol^{-2} L^{-1} (d) mol^2 L^{-2}

20. What is the correct representation of the solubility product constant of Ag_2CrO_4?

(a) $[Ag^+]^2 [CrO_4^{-2}]$ (b) $[Ag^+] [CrO_4^{-2}]$ (c) $[2Ag^+] [CrO_4^{-2}]$ (d) $[2Ag^+]^2 [CrO_4^{-2}]$

21. Which pair will show common ion effect?

(a) $BaCl_2 + Ba(NO_3)_2$ (b) NaCl + HCl (c) $NH_4OH + NH_4Cl$ (d) AgCN + KCN

9. ELECTROCHEMISTRY

1. The number of electrons that have a total charge of 9650 coulombs is

a) 6.22×10^{23} b) 6.022×10^{24} c) 6.022×10^{22} d) 6.022×10^{-34}

2. Consider the following half cell reactions: $Mn^{2+} + 2e- \rightarrow Mn$ $E° = -1.18V$

$Mn^{2+} \rightarrow Mn^{3+} + e-$ $E = -1.51V$

The $E°$ for the reaction $3Mn^{2+} \rightarrow Mn+2Mn^{3+}$, and the possibility of the forward reaction are respectively. a) 2.69V and spontaneous b) -2.69 and non spontaneous

c) 0.33V and Spontaneous d) 4.18V and non spontaneous

3. The button cell used is watches function as follows

$Zn(s) + Ag_2O(s) + H_2O(l) \leftrightarrow 2Ag(s) + Zn^{2+}(aq) + 2OH^-(aq)$

the half cell potentials are $Ag_2O(s) + H_2O(l) + 2e^- \rightarrow 2Ag(s) + 2OH^-(aq)$ $E° = 0.34V$

The cell potential will be a) 0.84V b) 1.34V c) 1.10V d) 0.42V

4. The molar conductivity of a 0.5 mol dm^{-3} solution of $AgNO_3$ with electrolytic conductivity of 5.76×10^{-3} S cm^{-1} at 298 K is a) 2.88 S $cm^2 mol^{-1}$ b) 11.52 S $cm^2 mol^{-1}$

c) 0.086 S $cm^2 mol^{-1}$ d) 28.8 S cm^2 mol^{-1}

5.

Electrolyte	KCl	KNO_3	HCl	NaOAC	NaCl
Λ_m (S cm^2 mol^{-1})	149.9	145.0	426.2	91.0	126.5

Calculate $\Lambda°_{HOAC}$ using appropriate molar conductances of the electrolytes listed above at infinite dilution in water at 25° C . a) 517.2 b) 552.7 c) 390.7 d) 217.5

6. Faradays constant is defined as

a) charge carried by 1 electron b) charge carried by one mole of electrons

c) charge required to deposit one mole of substance d) charge carried by 6.22×10^{10} electrons.

7. How many faradays of electricity are required for the following reaction to occur

$MnO_4^- \rightarrow Mn^{2+}$ a) 5F b) 3F c) 1F d) 7F

8. A current strength of 3.86 A was passed through molten Calcium oxide for 41minutes and 40 seconds. The mass of Calcium in grams deposited at the cathode is (atomic mass of Ca is 40g / mol and 1F = 96500C). a) 4 b) 2 c) 8 d) 6

9. During electrolysis of molten sodium chloride, the time required to produce 0.1mol of chlorine gas using a current of 3A is

a) 55 minutes b) 107.2 minutes c) 220 minutes d) 330 minutes

10. The number of electrons delivered at the cathode during electrolysis by a current of 1A in 60 seconds is (charge of electron = 1.6×10^{-19}C)

a) 6.22×10^{23} b) 6.022×10^{20} c) 3.75×10^{20} d) 7.48×10^{23}

11. Which of the following electrolytic solution has the least specific conductance

a) 2N b) 0.002N c) 0.02N d) 0.2N

12. While charging lead storage battery

a) $PbSO_4$ on cathode is reduced to Pb b) $PbSO_4$ on anode is oxidised to PbO_2

c) $PbSO_4$ on anode is reduced to Pb d) $PbSO_4$ on cathode is oxidised to Pb

13. Among the following cells I) Leclanche cell II) Nickel – Cadmium cell

III) Lead storage battery IV) Mercury cell

Primary cells are a) I and IV b) I and III c) III and IV d) II and III

14. Zinc can be coated on iron to produce galvanized iron but the reverse is not possible. It is Because a) Zinc is lighter than iron b) Zinc has lower melting point than iron

c) Zinc has lower negative electrode potential than iron

d) Zinc has higher negative electrode potential than iron

15. Assertion : pure iron when heated in dry air is converted with a layer of rust.

Reason : Rust has the compositionFe_3O_4

a) if both assertion and reason are true and reason is the correct explanation of assertion.

b) if 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.

16. In H_2 -O_2 fuel cell the reaction occur at cathode is

a) $O_2(g) + 2H_2O\ (l) + 4e- \rightarrow 4OH^-\ (aq)$ b) $H^+(aq) + OH^-\ (aq) \rightarrow H_2O\ (l)$

c) $2H_2\ (g) + O_2\ (g) \rightarrow 2H_2O\ (g)$ d) $H^+ + e^- \rightarrow ½\ H_2$

17. The equivalent conductance of M/36 solution of a weak monobasic acid is 6mho cm^2 equivalent $^{-1}$ and at infinite dilution is 400 mho cm^2 equivalent $^{-1}$. The dissociation constant of this acid is a) 1.25×10^{-6} b) 6.25×10^{-6} c) 1.25×10^{-4} d) 6.25×10^{-5}

18. A conductivity cell has been calibrated with a 0.01M, 1:1 electrolytic solution (specific conductance (k =1. 25×10^{-3} S cm^{-1}) in the cell and the measured resistance was 800 ohm at 25°C . The cell constant is, a) 10^{-1} c m^{-1} b) 10^{1} c m^{-1} c) 1 c m^{-1} d) $5.7\ 10^{-12}$

19. Conductivity of a saturated solution of a sparingly soluble salt AB (1:1 electrolyte) at 298K is 1.85×10^{-5} S m^{-1} . Solubility product of the salt AB at 298K $(\Lambda^\circ_m)^-_{AB} = 14 \times 10^{-3}$ S m^2 mol^{-1} .

a) 5.7×10^{-12} b) 1.32×10^{-12} c) 7.5×10^{-12} d) $1.74\ 10^{-12}$

20. In the electrochemical cell: Zn | $ZnSO_4$ (0.01M) || $CuSO_4$ (1.0M) | Cu , the emf of this Daniel cell is E_1. When the concentration of is changed to 1.0M and that $CuSO_4$ changed to 0.01M, the emf changes to E_2. From the followings, which one is the relationship between E_1 and E_2? a) $E_1 < E_2$ b) $E_1 > E_2$ c) $E_2 \geq E_1$ d) E1 = E2

21. Consider the change in oxidation state of Bromine corresponding to different emf values as shown in the diagram below: Then the species undergoing disproportional is

$$BrO_4^- \xrightarrow{1.82V} BrO_3^- \xrightarrow{1.5V} HBrO \xrightarrow{1.595V} Br_2 \xrightarrow{1.0652V} Br^-$$

a) Br_2 b) BrO_4^- c) BrO_3^- d) HBrO

22. For the cell reaction $2Fe^{3+}(aq) + 2I^-(aq) \rightarrow 2Fe^{2+}\ (aq) + I_2\ (aq)$

E°_{cell} = 0.24V at 298K. The standard Gibbs energy (Δ, G°) of the cell reactions is :

a) -46.32 KJ mol^{-1} b) -23.16 KJ mol^{-1} c) 46.32 KJ mol^{-1} d) 23.16 KJ mol^{-1}

23. A certain current liberated 0.504gm of hydrogen in 2 hours. How many grams of copper can be liberated by the same current flowing for the same time in a copper sulphate solution

a) 31.75 b) 15.8 c) 7.5 d) 63.5

24. A gas X at 1 atm is bubble through a solution containing a mixture of 1MY- and 1MZ^- at 25°C . If the reduction potential of Z > Y > X, then

a) Y will oxidize X and not Z b) Y will oxidize Z and not X

c) Y will oxidize both X and Z d) Y will reduce both X and Z

25. Cell equation : $A + 2B^- \rightarrow A^{2+} + 2B$;

$A^{2+} + 2e^- \rightarrow A$ $E° = +0.34$ V and $\log_{10} K = 15.6$ at 300K for cell reactions find E° for $B^+ + e- \rightarrow B$ (AIIMS – 2018) a) 0.80 b) 1.26 c) -0.54 d) -10.94

ADDITIONAL QUESTIONS:

1. Electro chemical reactions are generally (a) Reduction reactions (b) oxidation reactions (c) Redox reactions (d) condensation reactions
2. The unit of resistivity is (a) $\Omega\ m^{-1}$ (b) $\Omega\ m$ (c) $m^{-1}Ohm^2$ (d) $\Omega^{-1}m^{-1}$
3. The unit of specific resistance is equal to

   (a) Ohm metre (b) Ohm^{-1} metre (c) Ohm^{-1} $metre^{-1}$ (d) Ohm
4. Which is the SI unit of conductance?

   (a) $Siemen^{-1}$ (or) S^{-1} (b) Siemen (or) S (c) Sm^{-1} (d) $S^{-1}m^{-1}$
5. Which one is the unit of specific conductance?

   (a) Ohm m (b) Ohm^{-1} m (c) Ohm m^{-1} (d) Ohm^{-1} m^{-1}.
6. The unit of equivalent conductance is ……

   (a) Sm^2g equivalent (b) Sm^{-1} (c) $Ohm^{-1}m^{-1}$ (d) Ohm m
7. Which one of the following is used to measure conductivity of ionic solutions?

   (a) metre scale (b) wheat stone bridge (c) Dynamo (d) Ammeter
8. Which of the following is used to calculate the conductivity of strong electrolytes?

   (a) Kohlraush's law (b) Henderson equation

   (c) Debye-Huckel and Onsagar equation (d) Ostwald's dilution law
9. Which one of the following represents Debye-Huckel and Onsagar equation?

(a) $\left(\Lambda_m^\circ\right)_{A_xB_y} = x\left(\lambda_m^\circ\right)_{A^y} + y\left(\lambda_m^\circ\right)_{B^{x-}}$ (c) $K_a = \frac{\alpha^2 C}{1-\alpha}$

(b) $\Lambda_m = \Lambda_m^\circ - \left(A + B\Lambda_m^\circ\right)\sqrt{C}$ (d) $\Lambda_m^\circ = \Lambda_- (A+B)\Lambda_m^\circ - C$

10. Kohlrausch's law is applied to calculate

(a) molar conductance at infinite dilution of a weak electrolyte

(b) degree of dissociation of weak electrolyte

(c) solubility of a sparingly soluble salt

(d) all the above

11. The salt bridge used in Daniel cell contains

(a) Na_2SO_4 + NaCl (b) Agar-Agar gel + Na_2SO_4

(c) Silica gel + $CuSO_4$ (d) $ZnSO_4$ + $CuSO_4$

12. Which one of the following can act as an inert electrode?

(a) Graphite (b) Copper (c) Platinum (d) either a (or) e

13. The emf of Daniel cell $Zn_{(s)} + Zn^{2+}_{aq(1m)} || Cu^{2+}_{aq(1m)} | Cu_{(S)}$ iS equal to ……

(a) – 1.107 Volts (b) 1.107 Volts (c) 3.4 Volt (d) 7.6 Volt

14. The value of EMF of standard hydrogen electrode at 25°C is ……

(a) maximum (b) zero (c) negative (d) positive

15. The electrode used in SHE is made of ……

(a) graphite (b) copper (c) platinum (d) iron

16. The maximum work that can be obtained from a galvanic cell is …….

(a) + nFE (b) – nFE (c) 2F (d) 96500 F

17. For all spontaneous cell reactions, the value of ?G should be ……

(a) constant (b) zero (c) negative (d) positive

18. The value of one Faraday is equal to …….

(a) 96400 C (b) 96500 C (c) 1 .602 x 10^{-19}C (d) 1 .602 x 10^{19}C

19. Which equation relates the cell potential and the concentration of the species involved in an electro chemical reaction? (a) Henderson equation (b) Arrhenius equation

(c) Debye Huckel Onsagar equation (d) Nemst equation

20. Which one of the following is Nernst equation.

(a) $E_{cell} = E^{\circ}_{cell} + \frac{0.0591}{n} \log \frac{[C]^l [D]^m}{[A]^x [B]^y}$

(b) $E_{cell} = E^{\circ}_{cell} - \frac{0.0591}{n} \log \frac{[A]^x [B]^y}{[C]^l [D]^m}$

(c) $E_{cell} = E^{\circ}_{cell} - \frac{0.0591}{n} \log \frac{[C]^l [D]^m}{[A]^x [B]^y}$

(d) $E^{\circ}_{cell} = E_{cell} - \frac{0.0591}{n} \log \frac{[A]^x [B]^y}{[C]^l [D]^m}$

21. Which one of the following represents Faraday's first law?

(a) m = Zit (b) m = Z/It (c) m = It/Z (d) Z = mIt

22. When 1 coulomb of electric current is passed the amount of substance deposited or liberated is known as (a) equivalent mass (b) electro chemical equivalent (c) molar mass (d) 1 Faraday

23. Which one of the following is used in cell phone, dry cell in flashlight?

(a) Zn – Cu battery (b) Li – ion battery (c) Ag – Cu battery (d) Na, NaCl battery

24. The primary batteries are …….

(a) rechargeable (b) non – rechargeable (c) reversible (d) renewable

25. The anode and cathode used in Leclanche cell are …… respectively.

(a) Zinc, Graphite rod with MnO_2 (b) Graphite rod in MnO_2 and Zinc container

(c) Zn container and copper rod (d) Copper container and Zinc rod

26. Which electrolyte is used in Leclanche cell?

(a) $ZnSO_4 + CuSO_4$ (b) $NH_4Cl + ZnCl_2$ (c) $NaCl + CuSO_4$ (d) $MnSO_4 + MnO_2$

27. Which one of the following is used as cathode in Mercury button cell?

(a) Zinc (b) Copper (c) Zinc amalgamated with mercury (d) HgO mixed with graphite

28. Which one of the following is used as anode in Mercury button cell?

(a) HgO mixed with graphite (b) Zinc amalgamated with mercury

(c) Copper amalgamated with Mercury (d) HgO mixed with Copper

29. The value of cell emf of Mercury button cell is …….

(a) 1.35V (b) – 076V (c) 0.34V (d) 100V

30. The electrolyte used in Mercury button cell is (a) Paste of kOH and ZnO

(b) $CuSO_4 + ZnSO_4$ (c) $NaCl + MgCl_2$ (d) $NH_4Cl + ZnCl_2$

31. Which of the following is an example of secondary batteries?

(a) Mercury button cell (b) Leclanche cell (c) Lead storage battery (d) Daniel cell

32. Which of the following act as cathode and anode in Lead storage battery?

(a) Lead plate bearing PbO_2, spongy Lead (b) Spongy lead, lead plate bearing PbO_2

(c) Lead Copper (d) Mercury oxide, PbO

33. Which one of the following is used as an electrolyte in H_2O_2 fuel cell?

(a) Aqueous $CuSO_4$ (b) Aqueous CoO_2 (c) Aqueous KOH (d) $NH_4Cl + ZnCl_2$

34. The formula of rust is …….

(a) Fe_2O_3 (b) $Fe_2O_3.xH_2O$ (c) FeO (d) $FeO.xH_2O$

35. The electro plating of Zinc over a metal is called …….

(a) Electrolysis (b) Redox reaction (c) Galvanisation (d) Passivation

36. Which amount of chlorine gas liberated at anode, if 1 ampere current is passed for 30 minutes from NaCl solution? (a) 0.66 moles (b) 0.33 moles (c) 0.66 g (d) 0.33 g

10. SURFACE CHEMISTRY

1. For freudlich isotherm a graph of log x/m is plotted against log P. The slope of the line and its y – axis intercept respectively corresponds to

a) 1/n, k b) log 1/n, k c) 1/n, log k d) log 1/n, log k

2. Which of the following is incorrect for physisorption?

a) reversible b) increases with increase in temperature

c) low heat of adsorption d) increases with increase in surface area

3. Which one of the following characteristics are associated with adsorption? (NEET)

a) ΔG and ΔHare negative but ΔS is positive b) ΔGand ΔS are negative but ΔH is positive

c) ΔG is negative but ΔH and ΔS are positive d)ΔG, ΔH and ΔS all are negative.

4. Fog is colloidal solution of a) solid in gas b) gas in gas c) liquid in gas d) gas in liquid

5. Assertion : Coagulation power of Al^{3+} is more than Na^{+}.

Reason : greater the valency of the flocculating ion added, greater is its power to cause precipitation

a) if both assertion and reason are true and reason is the correct explanation of assertion.

b) if 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.

6. Statement : To stop bleeding from an injury, ferric chloride can be applied. Which comment about the statement is justified? a) It is not true, ferric chloride is a poison.

b) It is true, Fe^{3+} ions coagulate blood which is a negatively charged sol

c) It is not true; ferric chloride is ionic and gets into the blood stream.

d) It is true, coagulation takes place because of formation of negatively charged sol with Cl^{-}.

7. Hair cream is a) gel b) emulsion c) solid sol d) sol.

8. Which one of the following is correctly matched?

a) Emulsion – Smoke

b) Gel – butter

c) foam – Mist

d) whipped cream – sol

9. The most effective electrolyte for the coagulation of As_2S_3 Sol is

a) NaCl b) $Ba(NO_3)_2$ c) $K_3[Fe(CN)_6]$ d) $Al_2(SO4)3$

10. Which one of the is not a surfactant? a) $CH_3(CH_2)_{15}N^{+}(CH_3)_2CH_2Br$

b) $CH_3(CH_2)_{15}NH_2$ c) $CH_3(CH_2)_{16}CH_2OSO_2^{-}Na^{+}$ d) $OHC(CH_2)_{14}CH_2COO^{-}Na^{+}$

11. The phenomenon observed when a beam of light is passed through a colloidal solution is

a) Cataphoresis b) Electrophoresis c) Coagulation d) Tyndall effect

12. In an electrical field, the particles of a colloidal system move towards cathode. The coagulation of the same sol is studied using K_2SO_4 (i), Na_3PO_4 (ii), $K_4[Fe(CN_6)]$ (iii) and NaCl (iv) Their coagulating power should be

a) II > I>IV > III b) III > II > I > IV c) I > II > III > IV d) none of these

13. Collodion is a 4% solution of which one of the following compounds in alcohol – ether mixture? a) Nitroglycerine b) Cellulose acetate c) Glycoldinitrate d) Nitrocellulose

14. Which one of the following is an example for homogeneous catalysis?

a) manufacture of ammonia by Haber's process b) manufacture of sulphuric acid by contact process c) hydrogenation of oil d) Hydrolysis of sucrose in presence of all HCl

15. Match the following

A) V_2O_5 - i) High density polyethylene

B) Ziegler – Natta - ii) PAN

C) Peroxide - iii) NH_3

D) Finely divided Fe - iv) H_2SO_4

	A	B	C	D
a)	(iv)	(i)	(ii)	(iii)
b)	(i)	(ii)	(iv)	(iii)
c)	(ii)	(iii)	(iv)	(i)
d)	(iii)	(iv)	(ii)	(i)

16. The coagulation values in millimoles per litre of the electrolytes used for the coagulation of As_2S_3 are given below (I) (NaCl)=52 (II) (($BaCl_2$)=0.69 (III) ($MgSO_4$)=0.22

The correct order of their coagulating power is

a) III > II > I b) I > II > III c) I > III > II d) II > III>I

17. Adsorption of a gas on solid metal surface is spontaneous and exothermic, then

a) ΔH increases b) ΔS increases c) ΔG increases d) ΔS decreases

18. If x is the amount of adsorb ate and m is the amount of adsorbent, which of the following relations is not related to adsorption process?

a) x/m=f(P) at constant T b) x/m=f(T) at constant P

c) P = f(T) at constant m/*x* d) *x*/m= PT

19. On which of the following properties does the coagulating power of an ion depend ? (NEET – 2018) a) Both magnitude and sign of the charge on the ion. b) Size of the ion alone

c) the magnitude of the charge on the ion alone d) the sign of charge on the ion alone.

20. Match the following

A) Pure nitrogen	-	i) Chlorine
B) Haber process	-	ii) Sulphuric acid
C) Contact process	-	iii) Ammonia
D) Deacons Process	-	iv) sodium azide (or) Barium azide

Which of the following is the correct option?

	A	B	C	D
a)	(i)	(ii)	(iii)	(iv)
b)	(ii)	(iv)	(i)	(iii)
c)	(iii)	(iv)	(ii)	(i)
d)	(iv)	(iii)	(ii)	(i)

ADDITIONAL QUESTIONS :

1. When gas molecules are held to the surface by the formation of chemical bond the heat energy released is nearly equal to

   (a) 40 kJ/mole (b) 800 kJ/mole (c) 400 kJ/mole (d) 4 kJ/mole

2. Consider the following statements:

   (i) In chemisorption, heat of adsorption is high

   (ii) Monolayer of the adsorbate is formed during chemisorption

   (iii) Physisorption increases with increase in temperature.

   Which of the above statement is / are not correct'?

   (a) (i) & (ii) (b) (iii) only (c) (ii) only (d) (i) only

3. Which of the following gases is not a permanent gas?

   (a) NH_3 (b) H_2 (c) N_2 (d) O_2

4. Which is employed in the softening of hardwater to absorb Ca^{2+} and Mg^{2+} ions?

   (a) Alumina (b) Silica gel (c) Permutit (d) Charcoal

5. Which of the following is used in petroleum refining and refining of vegetable oils?

   (a) Charcoal (b) Silica gel (c) Pcrmutit (d) Nickel

6. The catalyst used in the hydrogenation of oils to obtain vanaspathi is ……

(a) Iron (b) Molybdenum (c) Nickel (d) Copper

7. The catalyst and promoter used in Haber's process are respectively …….

(a) Mo, Fe (b) Fe, Mo (c) Pt, H_2S (d) Pt, V_2O_5

8. Which method is used for identification, detection and estimation of many substances even if they are in micro quantities?

(a) Lassaigne's test (b) Canus method (c) Kjeldhals method (d) Chromatography

9. Which one of the following is an example for heterogeneous catalysis?

(a) Decomposition of acetaldehyde by I_2 catalyst

(b) Decomposition of H_2O_2 in the presence of Pt catalyst

(c) Acid hydrolysis of ester

(d) Hydrolysis of cane sugar with mineral acid

10. The catalyst poison in contact process of manufacture of SO_3 is ……

(a) As_2O_3 (b) H_2S (c) CO (d) As_2S_3

11. In Haber's process of manufacture of ammonia, the Fe catalyst is poisoned by the pressure of

(a) Mo (b) Co (c) H_2S (d) As_2O_3

12. In the reaction $2H_2 + O_2 \rightarrow 2H_2O$ acts as a catalytic poison for Pt catalyst.

(a) Co (b) Mo (c) As_2O_3 (d) H_2S

13. The negative catalyst in the decomposition of H_2O_2 is …….

(a) Ethanol (b) Acetic acid (c) Ethanoic acid (d) Methanol

14. The energy required for the reactants to reach the activated complex is called ……

(a) threshold energy (b) activation energy (c) internal energy (d) Gibbs free energy

15. Which enzyme catalyses the conversion of glucose into ethanol?

(a) maltase (b) invertase (c) diastase (d) zymase

16. Which one of the following is used as a catalyst in the conversion of Lindane to cyclohexane?

(a) Fe°/Pd° (b) Ni (c) Zn + HCl (d) $LiAlH_4$

17. An example of liquid aerosol is …….

(a) Soda water (b) Milk (c) Fog (d) Inks

18. Which method is used to prepare metal sols?

(a) ultrasonic dispersion (b) mechanical dispersion (c) Bredigs arc method (d) peptisation

19. Which method is used to prepare mercury colloid?

(a) peptisation (b) mechanical dispersion (c) ultrasonic dispersion (d) Bredig's arc method

20. The conversion of a precipitate into colloid is called ……..

(a) coagulation (b) hydrolysis (c) condensation (d) peptisation

21. The process of conversion of colloidal solution into precipitate is known as ……..

(a) peptisation (b) dispersion (c) coagulation (d) decomposition

22. Which of the following is the size of the colloidal particle?

(a) 100 µm diameter – 1000 µm diameter (b) 1 mµ to 1 µm diameter

(c) 1 mµ to 100 µm diameter (d) 1 µm to 1 µm diameter

23. The shape of tungstic acid W_3O_5 sol is ……

(a) spherical (b) disc (c) plate like (d) rod like

24. Which one of the following colloid has spherical shape?

(a) AS_2S_3 (b) $Fe(OH)_3$ (c) W_3O_5 (d) dust

25. Tyndall effect is possible in colloid due to ……

(a) absorption of light (b) adsorption of light (c) scattering of light (d) reflection of light

26. The migration of sol particles under the influence of electric field is called ……

(a) electro osmosis (b) electro dialysis (c) electrophoresis (d) dialysis

27. The movement of dispersion medium under the influence of electric potential is called ……

(a) Electrophoresis (b) Cataphoresis (c) Electro osmosis (d) Electro dialysis

28. Which one of the following is not used to identify the types of emulsion?

(a) dye test (b) viscosity test (c) conductivity test (d) Tollen's test

29. Which one of the following is used in the purification of drinking water?

(a) silver sol protected by gelatin (b) milk of magnesia

(c) Alum containing Al^{3+} (d) Argyrol

30. Which one of the following is used in tanning of leather?

(a) chromium salt (b) colloidal Au (c) Argyrol (d) $Fe(OH)_3$

31. Which one of the following is used to distinguish Natural honey and artificial honey?

(a) Ammoniacal $AgNO_3$ (b) Fehling's solution (c) Arsenic suiphide sol (d) gelatin

32. Gold number gives ……..

(a) the amount of gold present in the colloid

(b) the amount of gold required to break the colloid

(c) the amount of gold required to protect the colloid

(d) the measure of protective power of a lyophillic colloid

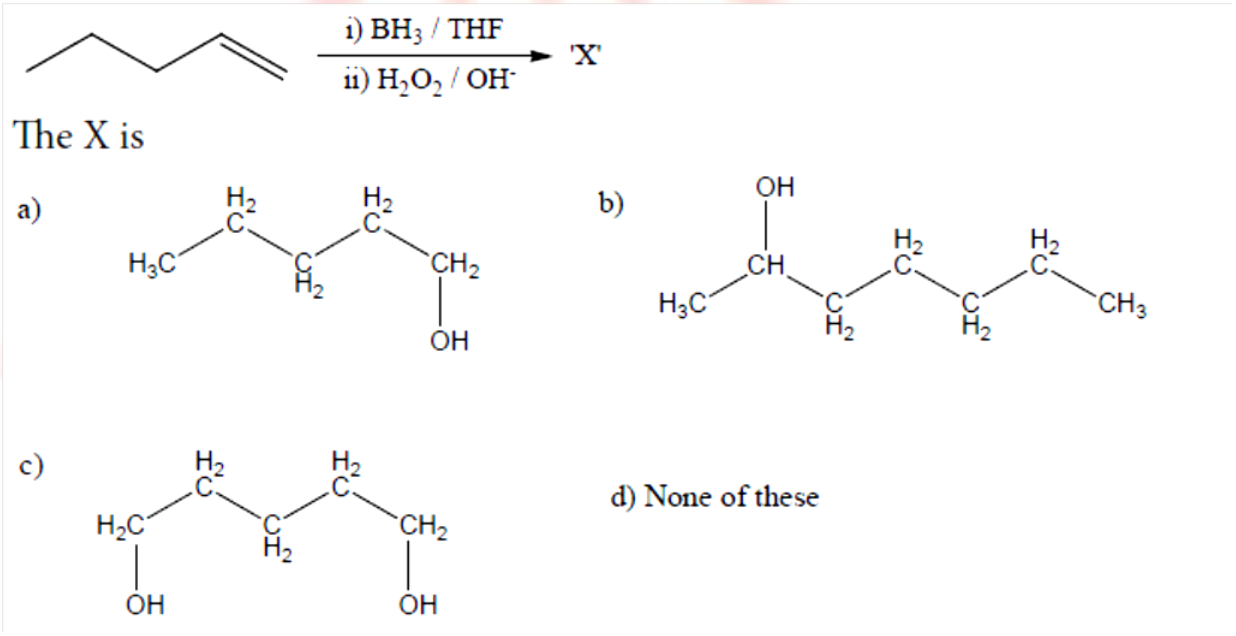
11. HYDROXY COMPOUNDS AND ETHERS

1. An alcohol (x) gives blue colour in victormayer's test and 3.7g of X when treated with metallic sodium liberates 560 mL of hydrogen at 273 K and 1 atm pressure what will be the possible structure of X? a) CH_3 CH (OH) CH_2CH_3 b) CH_3 – CH (OH) – CH_3

c) CH_3 – C (OH) – $(CH_3)_2$ d) CH_3- CH_2 –CH (OH) – CH_2 – CH_3

2. Which of the following compounds on reaction with methyl magnesium bromide will give tertiary alcohol. a) benzaldehyde b) propanoic acid c) methyl propanoate d) acetaldehyde

3.



Ethene $\xrightarrow{HOCl}$ A $\xrightarrow{X}$ ethan -1, 2 - diol

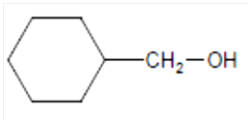
4. In the reaction sequence, . A and X respectively are

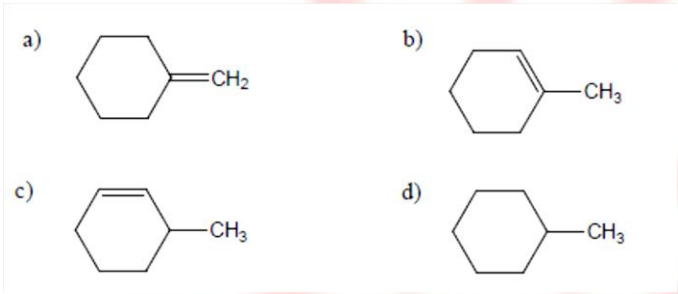
a) Chloroethane and NaOH b) ethanol and H_2SO_4

c) 2 – chloroethan -1-ol and $NaHCO_3$ d) ethanol and H_2O

5. Which one of the following is the strongest acid

a) 2 - nitrophenol b) 4 – chlorophenol c) 4 – nitrophenol d) 3 – nitrophenol

6.  on treatment with Con H SO 2 4, predominately gives



7. Carbolic acid is

a) Phenol b) Picri cacid d) benzoic acid d) phenylacetic acid

8. Which one of the following will react with phenol to give salicyladehyde after hydrolysis.

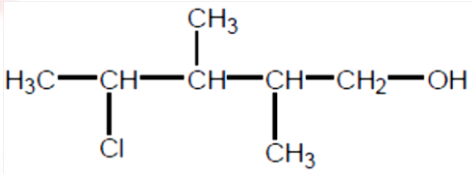
a) Dichlo methane b) trichloroethane c) trichloro methane d) CO_2

9. $(CH_3)_3$ - C - CH(OH) $CH_3 \xrightarrow{Con\ H2SO4}$ X (major product)

a) $(CH_3)_3$ CCH = CH_2 b) $(CH_3)_2$ C = C $(CH_3)_2$

c) CH_2 = C$(CH_3)$$CH_2$ – CH_2 - CH_3 d) CH_2 = C (CH_3) – CH_2 – CH_2 - CH_3

10. The correct IUPAC name of the compound,



a) 4 – chloro – 2,3 – dimethyl pentan – 1-ol

b) 2,3 – dimethyl – 4- chloropentan -1-ol

c) 2,3,4 – trimethyl – 4- chlorobutan -1-ol

d) 4 – chloro – 2,3,4 – trimethyl pentan – 1-ol

11. Assertion : Phenol is more acidic than ethanol Reason: Phenoxide ion is resonance stabilized

a) if both assertion and reason are true and reason is the correct explanation of assertion.

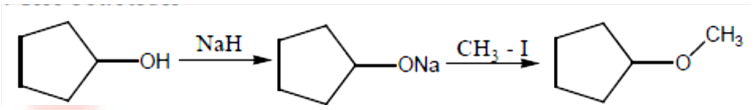
b) if both assertion and reason are true but reason is not the correct explanation of assertion.

c) assertion is true but reason is false d) both assertion and reason are false.

12. In the reaction 

The 'Z' is

a) ethane b) ethoxyethane c) ethylbisulphite d) ethanol

13. The reaction Can be classified as 

a) dehydration b) Williams on alcoholsynthesis

c) Williamson ether synthesis d) dehydrogenation of alcohol

14. Isoprophylbenzene on air oxidation in the presence of dilute acid gives

a) C_6H_5 COOH b) C_6 H_5 $COCH_3$ c) C_6 H_5 COC_6 H_5 d) C_6 H_5 - OH

15. Assertion : Phenol is more reactive than benzene towards electrophilic substitution reaction

Reason : In the case of phenol, the intermediate arenium ion is more stabilized by resonance.

a) if both assertion and reason are true and reason is the correct explanation of assertion.

b) if both assertion and reason are true but reason is not the correct explanation of assertion.

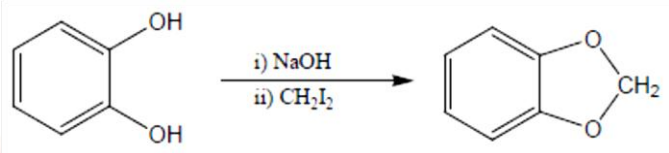
c) assertion is true but reason is false d) both assertion and reason are false.

16. HO CH_2 CH_2 – OH on heating with periodic acid gives

a) methanoic acid b) Glyoxal c) methanol d) CO_2

17. Which of the following compound can be used as artireeze in automobile rediators?

a) methanol b) ethanol c) Neopentyl alcohol d) ethan -1, 2-diol

18. The reactions is an example of 

a) Wurtz reaction b) cyclic reaction

c) Williamson reaction d) Kolbe reactions

19. One mole of an organic compound (A) with the formula C_3 H_8 O reacts completely with two moles of HI to form X and Y. When Y is boiled with aqueous alkali it forms Z. Z answers the iodoform test. The compound (A) is

a) propan – 2-ol b) propan -1-ol c) ethoxy ethane d) methoxy ehane

20. Among the following ethers which one will produce methyl alcohol on treatment with hot HI?

a) $(H_3C)_3C-O-CH_3$ b) $(CH_3)_2-CH-CH_2-O-CH_3$

c) $CH_3(CH_2)_3-O-CH_3$ d) $CH_3-CH_2-\underset{CH_3}{\underset{|}{CH}}-O-CH_3$

21. Williamson synthesis of preparing dimethyl ether is a / an /

a) SN1 reactions b) SN2 reaction

c) electrophilic addition d) electrophilic substitution

22. On reacting with neutral ferric chloride, phenol gives

a) red colour b) violet colour c) dark green colour d) no colouration.

ADDITIONAL QUESTIONS:

1. Which one of the following is named as sorbital?

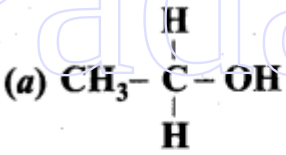
(a) $CH_2OH-CHOH-CH_2OH$

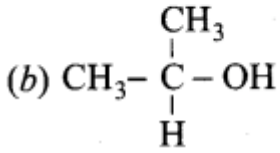
(b) $CH_3-(CH_2)_3-CH_2OH$

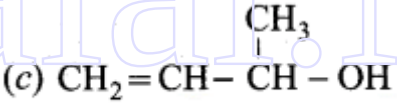
(c) C_6H_5OH

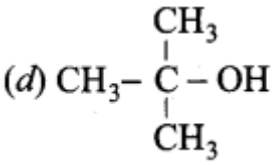
(d) $HO-CH_2-(CHOH)_4-CH_2OH$

2. Which one of the following is a primary alcohol?

(a) 

(b) 

(c) 

(d) 

3. Which of the following is a dihydric alcohol?

(a) Ethenol (b) Ethanol] (c) Ethane – 1, 2 – diol (d) Propan – 2 – ol

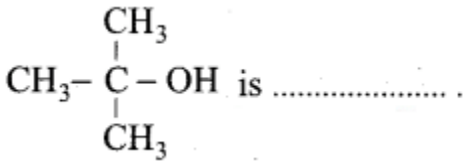
4. Which one of the following is an example of secondary (2°) alcohol?

(a) Propan – 2 – ol (b) Phenyl methanol (c) Ethenol (d) 2 – methyl – propan – 2 – ol

5. Which acts as an additive to petrol?

(a) Glycerol (b) Ethanol (c) Phenol (d) Methanol

6. The IUPAC name of



(a) 1 – methyl – 2 – propanol (b) 2 – methyl – p ropan – 2 – ol

(c) Tertibutyl alcohol (d) 2 – propanol

7. The TUPAC name of $CH_2 = CH – CH_2OH$ is ……

(a) Allyl alcohol (b) Propenc – 2 – ol (c) Prop – 2 – en – 1 – ol (d) Isopropyl alcohol

8. Which one of the following is named as Baeyer's reagent?

(a) acidified $K_2Cr_2O_7$ (b) acidified $KMnO_4$ (c) Cold dilute alkaline $KMnO_4$ (d) $LiAlH_4$

9. Which one of the following is called Lucas reagent?

(a) Conc. HCl + Anhydrous $ZnCl_2$ (b) Conc. HCl + Anhydrous $A1Cl_3$

(c) $LiAlH_4 + H_2O$ (d) Cold dilute alkaline $KMnO_4$

10. Which colour is given by secondary alcohol in Victor Meyer's test?

(a) Red (b) Green (c) Blue (d) Yellow

11. Which mechanism is followed in the conversion of ethanol to bromoethane by HBr?

(a) SN^1 mechanism (b) SN^2 mechanism (c) E_1 mechanism (d) E_2 mechanism

12. Which one of the following is the correct order of relative reactivities of alcohols in the dehydration reaction? (a) 1° < 2° < 3° (b) 2° < 1° < 3° (c) 3° < 2° < 1° (d) 3° < 1° < 2°

13. Which reaction is used to convert alcohol to ketone / aldehyde in the presence of DMSO?

(a) Lucas test (b) Swern oxidation (c) Biological oxidation (d) Kolbe's reaction

14. What is the name of the reaction between ethanol and ethanoic acid?

(a) Esterification (b) Saponification (c) Ethenfication (d) Hydroxylation

15. What is the product formed when ethylene glycol is heated at 773 K?

(a) Ethanal (b) Ethene (c) Ethane (d) Oxirane

16. Which one of the following is formed when ethane – 1, 2 – diol is treated with Conc. H_2SO_4?

(a) 1, 4 – dioxane (b) Ethanal (c) Ethanoic acid (d) Ethene

17. Which one of the following is formed when ethylene glycol is treated with periodic acid?

(a) Methanal (b) Methanol (c) Ethanol (d) Ethanal

18. Identify the product formed when glycerol is treated with nitric acid and conc. H_2SO_4?

(a) Nitroglycerine (b) Glyceryl triacetate (c) Prop – 2 – enal (d) Glyceric acid

19. Oxidation of glycerol with dil.HNO_3 gives ……

(a) Meso oxalic acid (b) Glyceric acid and tartronic acid

(c) Glycerose (d) Glyceraldehyde and dihydroxy acetone

20. Which one of the following is the correct decreasing order of acidity in alcohol?

(a) 1° alcohol > 2° alcohol > 3° alcohol (b) 3° alcohol > 2° alcohol> 1° alcohol

(c) 2° alcohol> 1° alcohol > 3° alcohol (d) 3° alcohol > 1° alcohol > 2° alcohol

21. The other name of 1 , 2, 3 – trihydroxy benzene is called …….

(a) Pholoroglucinol (b) Quinol (c) Pyrogallol (d) Hydroxy quinol

22. The IUPAC name of Catechol is known as …….

(a) 1 , 3 – dihydroxy benzene (b) 1, 2 – dihydroxy benzene

(c) 1, 4 – dihydroxy benzene (d) 1, 3, 5 – trihydroxy benzene

23. The reaction of chlorobenzene with NaOH is known as …….

(a) Kolbe's reaction (b) Riemcr – Ticmann reaction (c) Dow's process (d) Cumene synthesis

24. What will be the product formed when phenol is treated with zinc dust?

(a) Cumene (b) Toluene (c) Ethyl benzene (d) Benzene

25. The acetylation and benzoylation of phenol are called …….

(a) Dow's process (b) Schotten – Baumann reaction

(c) Reimer – Tiemann reaction (d) Williamson ether synthesis

26. Which one of the following is formed when phenol reacts with a mixture of Conc. HNO_3 and Conc.H_2SO_4?

(a) Ortho nitro phenol (b) Para nitro phenol

(c) 1, 2 – dinitro phenol (d) 2, 4 , 6 – trinitro phenol

27. The conversion reaction of phenol of salicylic acid is known as

(a) Schottan – Baumann reaction (b) Riemer – Ticmann reaction

(c) Kolbe's Schmitt reaction (d) Williamson's synthesis

28. What is the name of the reaction of phenol with chloroform and aqueous alkali?

(a) Kolbe's reaction (b) Cumene synthesis

(c) Rlemer – Tiemann reaction (d) Schottan – Baumann reaction

29. Which one of the following is formed when phenol is treated with chloroform and sodium hydroxide.

(a) Chiorobenzene (b) Salicylaldehyde

(c) Salicylic acid (d) Aniline

30. Which one of the following is formed when Phenol reacts with benzene diazonium chloride?

(a) P – hyclroxy diazo phenol (b) P – hydroxy azo benzene

(c) O – hydroxy benzene (d) O – hydroxy azo benzene

31. Bakelite is formed when phenol reacts with …….

(a) Methanol (b) Methanal (c) Ethanal (d) Ethanol

32. Which one of the following is an example for mixed ether?

(a) Methoxy methane (b) Phenoxy benzene (c) Methoxy benzene (d) Ethoxy ethane

33. Identify the product formed when ethanol is treated with Conc.H_2SO_4 at 413 K?

(a) Ethene (b) Ethane (c) 2 – butanol (d) Diethyl ether

34. The mechanism involved in Williamson's synthesis is ……

(a) E_1 (b) E_2 (c) SN^2 (d) SN^1

35. Anisole undergoes bromination with Br_2 in acetic acid in the absence of catalyst, the major product formed is

(a) O – bromoan isole (b) P – bromoan isole

(c) Benzyl bromide (d) Bromo benzene

36. Which one of the following is used as a surgical anesthetic agent in surgery?

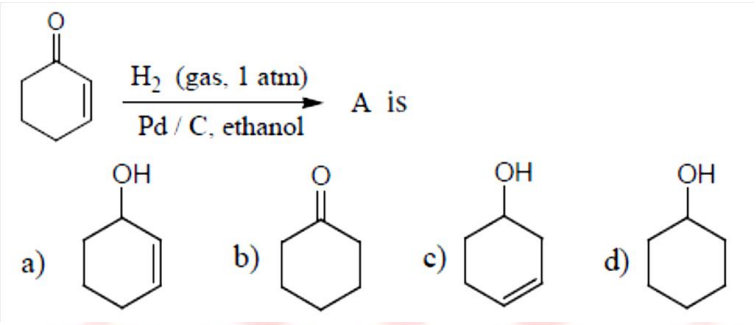
(a) Ethanol (b) Ethoxy ethane (c) Methoxy ethane (d) Methoxy propane

37. Oxygen atom in ether is ……

(a) very active (b) replacable (c) comparatively inert (d) less active

12. CARBONYL COMPOUNDS

1. The correct structure of the product 'A' formed in the reaction (NEET)



2. The formation of cyanohydrin from acetone is an example of

a) nucleophilic substitution b) electrophilic substitution

c) electrophilic addition d) Nucleophilic addition

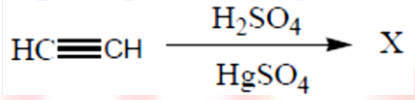
3. Reaction of acetone with one of the following reagents involves nucleophilic addition followed by elimination of water. The reagent is

a) Grignard reagent b) Sn / HCl

c) hydrazine in presence of slightly acidic solution d) hydrocyanic acid

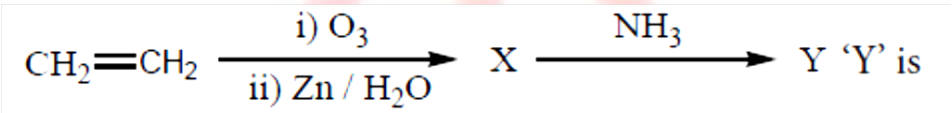
4. In the following reaction,

Product 'X' will not give



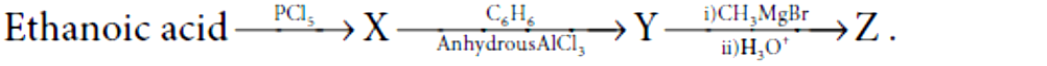
a) Tollen's test b) Victor meyer test c) Iodoform test d) Fehling solution test

5.

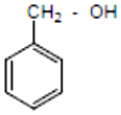


a) Formaldelyde b)diacetoneammonia c) hexamethylenetetraamine d) oxime

6. Predict the product Z in the following series of reactions



a) $(CH_3)_2C(OH)C_6H_5$ b) $CH_3CH(OH)C_6H_5$

c) $CH_3CH(OH)CH_2 - CH_3$ d) 

7. Assertion: 2,2 – dimethyl propanoic acid does not give HVZ reaction.

Reason: 2 – 2, dimethyl propanoic acid does not have – - hydrogen atom

a) if both assertion and reason are true and reason is the correct explanation of assertion.

b) if 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.

8. Which of the following represents the correct order of acidity in the given compounds

a) $FCH_2COOH > CH_3COOH > BrCH_2COOH > ClCH_2COOH$

b) $FCH_2COOH > ClCH_2COOH > BrCH_2COOH > CH_3COOH$

c) $CH_3COOH > ClCH_2COOH > FCH_2COOH > Br\text{-}CH_2COOH$

d) $Cl\,CH_2COOH > CH_3COOH > BrCH_2COOH > ICH_2COOH$

9. $\text{Benzoic acid} \xrightarrow[\text{ii) }\Delta]{\text{i) }NH_3} A \xrightarrow{NaOBr} B \xrightarrow{NaNO_2/HCl} C$ 'C' is

a) anilinium chloride b) O – nitro aniline

c) benzene diazonium chloride d) m – nitro benzoic acid

10. Ethanoic acid $\xrightarrow{Pb/Br2}$ 2 – bromoethanoic acid. This reaction is called

a) Finkelstein reaction b) Haloform reaction

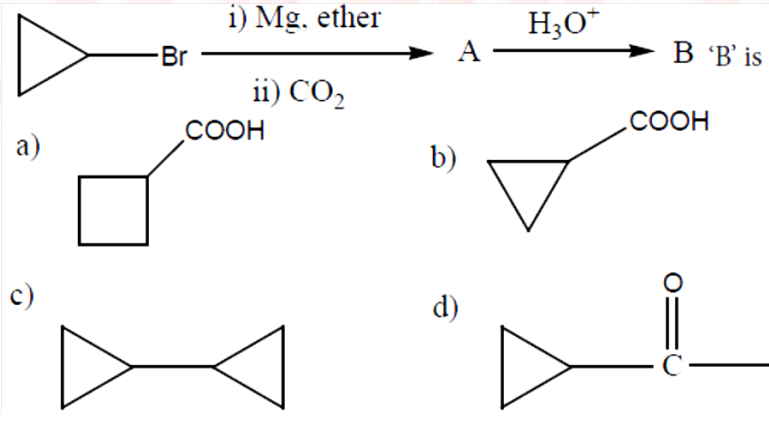
c) Hell – Volhard – Zelinsky reaction d) none of these

11 $CH_3Br \xrightarrow{KCN} (A) \xrightarrow{H_2O^+} (B) \xrightarrow{PCl_5} (C)$ product (c) is .

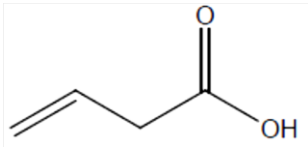
a) acetylchloride b) chloro acetic acid c) α- chlorocyano ethanoic acid d) none of these

12. Which one of the following reduces tollens reagent a) formic acid b) acetic acid

c) benzophenone d) none of these

13. 

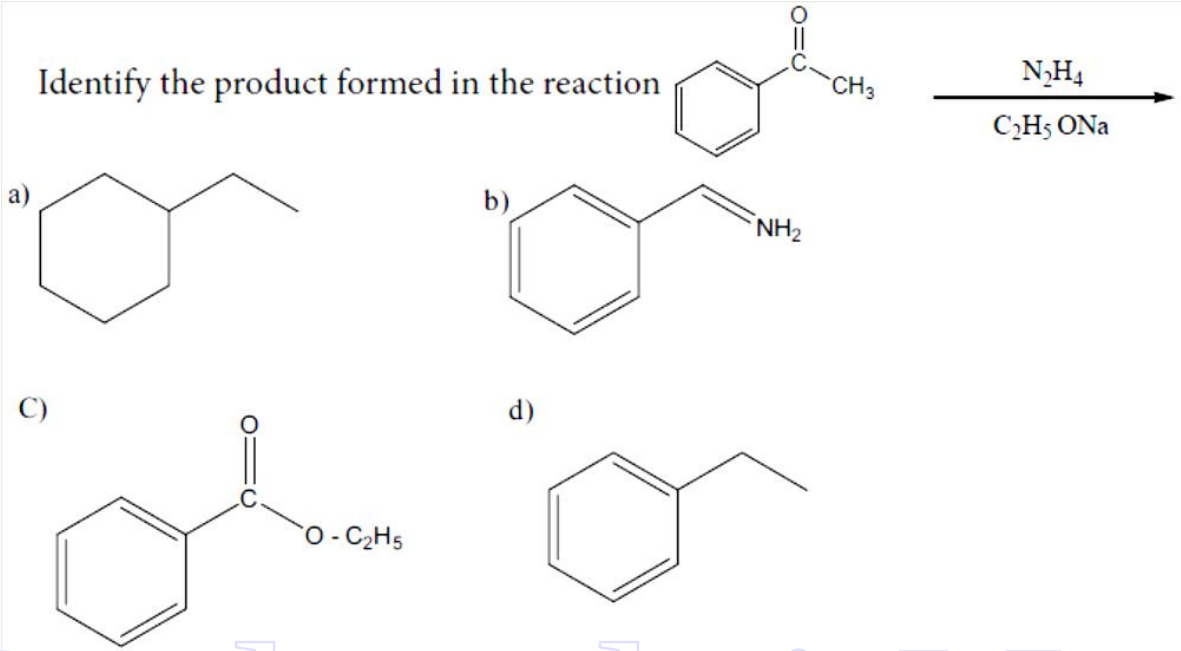
14. The IUPAC name of



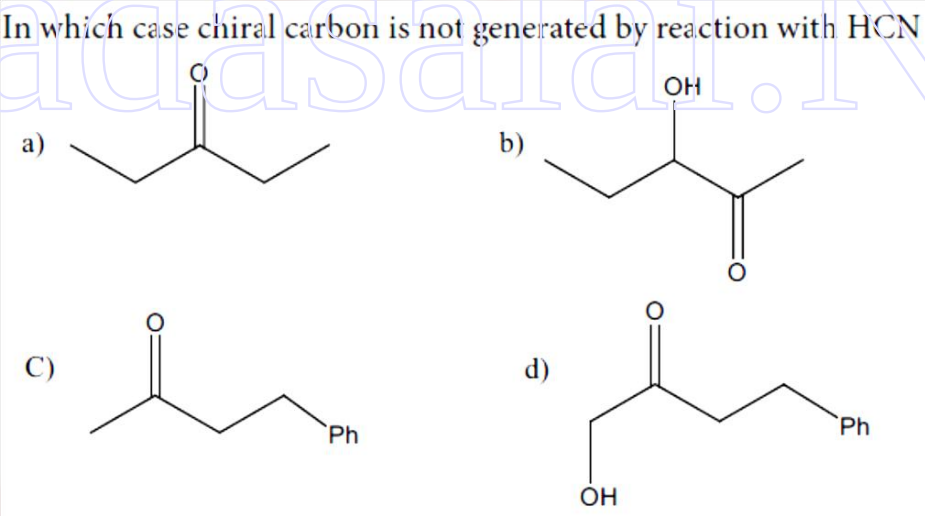
a) but – 3- enoicacid b) but – 1- ene-4-oicacid

c) but – 2- ene-1-oic acid d) but -3-ene-1-oicacid

15.



16.



17. Assertion : p – N, N – dimethyl aminobenzaldehyde undergoes benzoin condensation

Reason : The aldehydic (-CHO) group is meta directing

a) if both assertion and reason are true and reason is the correct explanation of assertion.

b) if 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.

18. Which one of the following reaction is an example of disproporationation reaction

a) Aldol condensation b) cannizaro reaction c) Benzoin condensation d) none of these

19. Which one of the following undergoes reaction with 50% sodium hydroxide solution to give the corresponding alcohol and acid

a) Phenylmethanal b) ethanal

c) ethanol d) methanol

20. The reagent used to distinguish between acetaldehyde and benzaldehyde is

a) Tollens reagent b) Fehling's solution c) 2,4 – dinitrophenyl hydrazine d) semicarbazide

21. Phenyl methanal is reacted with concentrated NaOH to give two products X and Y. X reacts with metallic sodium to liberate hydrogen X and Y are

a) sodiumbenzoate and phenol b) Sodium benzoate and phenyl methanol

c) phenyl methanol and sodium benzoate d) none of these

22. In which of the following reactions new carbon – carbon bond is not formed?

a) Aldol condensation b) Friedel craft reaction c) Kolbe's reaction d) Wolf kishner reduction

23. An alkene "A" on reaction with O_3 and Zn – H_2O gives propanone and ethanol in equimolar ratio. Addition of HCl to alkene "A" gives "B" as the major product. The structure of product "B" is

a) $Cl-CH_2-CH_2-CH(CH_3)_2$

b) $H_3C-CH_2-CH(CH_2Cl)-CH_3$

c) $H_3C-CH_2-C(CH_3)_2-Cl$

d) $H_3C-CH(CH_3)-CH(Cl)-CH_3$

24. Carboxylic acids have higher boiling points than aldehydes, ketones and even alcohols of comparable molecular mass. It is due to their (NEET)

a) more extensive association of carboxylic acid via van der Waals force of attraction

b) formation of carboxylate ion

c) formation of intramolecular H-bonding d) formation of intermolecular H – bonding

ADDITIONAL QUESTIONS:

1. The IUPAC name of Acrolein is (a) Prop – 2 – enal (b) Propanal (c) Ethenal (d) 1 – butanal
2. The conversion of acetyl chloride to acetaldehyde by the action of $Pd/BaSO_4$ is called ……..
   (a) Perkin's reaction (b) Stephens reaction (c) Clemmenoon reduction (d) Rosenmund reduction
3. In Rosenmunds reduction, the action of $BaSO_4$ is …….
   (a) Promoter (b) Catalyst poison (c) Positive catalyst (d) Negative catalyst
4. The conversion reaction of Benzene to Benzaldehyde is known as ……..
   (a) Rosenmund reduction (b) Stephen reduction
   (c) Gattermann koch reaction (d) Friedel – crafts reaction
5. The product formed when Benzoyl chloride reacts with benzene is ……
   (a) Benzyl benzoate (b) Benzophenone (c) Benzyl chloride (d) Benzyl alcohol
6. Which one of the following is used as catalyst in Friedel Crafts reaction?
   (a) Anhydrous $ZnCl_2$ (b) Anhydrous $CuCl_2$ (c) Anhydrous $AlCl_3$ (d) Androus $CaCl_2$
7. Which one of the following is formed when methanal reacts with ammonia?
   (a) Tetramethylene hexamine (b) Hexamethylene tetramine
   (c) Formaldehyde ammonia (d) Aldimine
8. Which one of the following is used as, an urinary antiseptic?
   (a) Urotropine (b) Urea formaldehyde (c) Formalin (d) Aldimm
9. Which one of the reactions gives an explosive RDX? (a) Nitration of phenol
   (b) Nitration of glycol (c) Nitration of urotropine (d) Nitration of glycerol
10. The product formed when Acetone is subjected to Clemmenson reduction is ……..
    (a) Acetic acid (b) Propanoic acid (c) Propane (d) Propanal
11. The reaction of benzaldehyde with 50% NaOH is called ……..
    (a) Benzoin condensation (b) Claisen – schmidt reaction
    (c) Perkin's reaction (d) Cannizaro reaction

12. The reaction of phenyl methanal and ethanal in the presence of dilute NaOH is known as ……

(a) Cannizaro reaction (b) Aldol condensation

(c) Claisen – schmidt condensation (d) Perkin's reaction

13. Which one of the following is formed when benzaldehyde reacts with alcoholic KOH?

(a) Benzyl alcohol (b) Potassium henzoate (c) Benzoin (d) Benzoic acid

14. What is the name of the reaction between Benzaldehyde and acetic anhydride?

(a) Peridn's reaction (b) Knoerenagal reaction (c) Cannizaro reaction (d) Kolbe's reaction

15. Which one of the following is the formula of Schiff' s base'?

(a) $C_6H_5 – NH\ NH_2$ (b) $C_6H_5\ CH = N – C_6H_5$ (b) Perkin's reaction (d) Aldol condensation

16. Which one of the following is used as a catalyst in Knoevenagal reaction?

(a) Pyrimidine (b) Pyridine (c) PCC (d) $CdCl_2$

17. Which one of the following is used to test ketones?

(a) lodoform test (b) Tollen's reagent test (c) Fehling's solution test (d) Benedict's solution test

18. Which one of the following is used as a hypnotic?

(a) Acetaldehyde (b) Formalin (c) Paraldehyde (d) Formaldehyde

19. Which one of the following is used as nail polish remover?

(a) CH_3CHO (b) HCHO (c) CH_3COCH_3 (d) $C_6H_5COCH_3$

20. The reaction of acetic acid with Cl_2 and red phosphorous is named as ……

(a) Kolbe's reaction (b) Reimer – Tiemann reaction

(c) HeII – volhard – zelinsky reaction (d) Knoevenagal reaction

21. Which is one the correct order of strength of carboxylic acid?

(a) $H-\overset{O}{\overset{\|}{C}}-OH > CH_3-\overset{O}{\overset{\|}{C}}-OH > CH_3-CH_2-\overset{O}{\overset{\|}{C}}-OH$

(b) $CH_3-\overset{O}{\overset{\|}{C}}-OH < H-\overset{O}{\overset{\|}{C}}-OH > CH_3-CH_2-\overset{O}{\overset{\|}{C}}-OH$

(c) $CH_3-\overset{O}{\overset{\|}{C}}-OH > CH_3-CH_2-\overset{O}{\overset{\|}{C}}-OH > H-\overset{O}{\overset{\|}{C}}-OH$

(d) $CH_3-CH_2-\overset{O}{\overset{\|}{C}}-OH > H-\overset{O}{\overset{\|}{C}}-OH > CH_3-\overset{O}{\overset{\|}{C}}-OH$

22. The correct increasing order acid strength of carboxylic acid is ……

(a) $F - CH_2 - COOH > I - CH_2 - COOH > Cl - CH_2 - COOH > Br - CH_2 - COOH$

(b) $Br - CH_2 - COOH > F - CH_2COOH > I - CH_2COOH > Cl - CH_2 - COOH$

(c) $F - CH_2 - COOH > Cl - CH_2COOH > Br - CH_2COOH > I - CH_2COOH$

(d) $Br - CH_2 - COOH > Cl - CH_2 - COOH > I - CH_2COOH > F - CH_2COOH$

23. The conversion of Ethyl acetate to propyl acetate by the action of propyl alcohol is named as

(a) Esterification (b) Transesterfication

(c) Acid hydrolysis of ester (d) Alkaline hydrolysis of ester

24. Which one of the following is used as food preservative?

(a) Sodium formate (b) Sodium acetate (c) Sodium benzoate (d) Acetamide

25. Which one of the following is used in the preparation of medicine like aspirin and phenacetin?

(a) Acetyl chloride (b) Acetic acid (c) Acetamide (d) Acetic anhydride

26. Which of the following will not give iodoform test?

(a) Isopropyl alcohol (b) Ethanol (c) Eth anal (d) Benzyl alcohol

27. The addition of HCN to carbonyl compounds is an example of …… reaction.

(a) N ucleophilic substitution (b) Electrophi ic addition

(c) Nucleophilic addition (d) Electrophilic substitution

28. The molecular formula of Urotropine is ……..

(a) $(CH_2)_6N_4$ (b) $(CH_2)_4N_6$ (c) $(CH_2)_2N_2$ (d) $(CH_2)_6N_6$

13. ORGANIC NITROGEN COMPOUNDS

1. Which of the following reagent can be used to convert nitrobenzene to aniline

a) Sn / HCl b) ZnHg / NaOH c) $LiAlH_4$ d) All of these

2. The method by which aniline cannot be prepared is

a) degradation of benzamide with Br_2 / NaOH b) potassium salt of phthalimide treated with chlorobenzene followed by hydrolysis with aqueous NaOH solution.

c) Hydrolysis of phenylcyanide with acidic solution d) reduction of nitrobenzene by Sn / HCl

3. Which one of the following will not undergo Hofmann bromamide reaction

a) $CH_3CONHCH_3$ b) $CH_3\ CH_2\ CON_2$ c) $CH_3\ CONH_2$ d) $C_6\ H_5\ CONH_2$

4. Assertion : Acetamide on reaction with KOH and bromine gives acetic acid

Reason : Bromine catalyses hydrolysis of acetamide.

a) if both assertion and reason are true and reason is the correct explanation of assertion.

b) if 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.

5. $CH_3CH_2Br \xrightarrow[\Delta]{\text{aq NaOH}} A \xrightarrow[\Delta]{KMnO_4/H^+} B \xrightarrow[\Delta]{NH_3} C \xrightarrow{Br_2/NaOH} D$ 'D' is

a) bromomethane b)α - bromo sodium acetate c) methanamine d) acetamide

6. Which one of the following nitro compounds does not react with nitrous acid

a) $CH_3\text{-}CH_2\text{-}CH_2\text{-}NO_2$ b) $(CH_3)_2CH\text{ - }CH_2NO_2$

c) $(CH_3)_3C\ NO_2$ d) $CH_3-\underset{\underset{O}{\|}}{C}-CH(NO_2)-CH_3$

7. Aniline + benzoylchloride $\xrightarrow{NaOH}$ $C_6\ H_5$ - NH - $COC_6\ H_5$ this reaction is known as

a) Friedel – crafts reaction b) HVZ reaction

c) Schotten – Baumann reaction d) none of these

8. The product formed by the reaction an aldehyde with a prmary amine (NEET)

a) carboxylic acid b) aromatic acid c) schiff 's base d) ketone

9. Which of the following reaction is not correct.

a) $CH_3CH_2NH_2 \xrightarrow{HNO_2} CH_3CH_2OH + N_2$

b) $(CH_3)_2N$-C_6H_4 $\xrightarrow{NaNO_2\ /\ HCl}$ $(CH_3)_2N$-C_6H_4-N = NCl

c) $CH_3CONH_2 \xrightarrow{Br_2/NaOH} CH_3NH_2$ d) none of these

10. When aniline reacts with acetic anhydride the product formed is

a) o – aminoacetophenone b) m-aminoacetophenone

c) p – aminoacetophenone d) acetanilide

11. The order of basic strength for methyl substituted amines in aqueous solution is

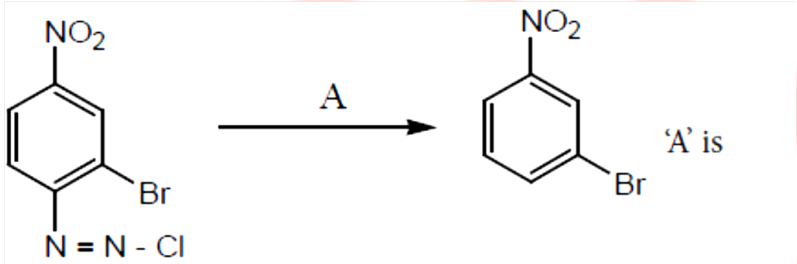
a) $N(CH_3)_3 > N(CH_3)_2H > N(CH_3)H_2 > NH_3$

b) $N(CH_3)H_2 > N(CH_3)_2H > N(CH_3)_3 > NH_3$

c) $NH_3 > N(CH_3)H_2 > N(CH_3)_2H > N(CH_3)_3$

d) $N(CH_3)_2H > N(CH_3)H_2 > N(CH_3)_3 > NH_3$

12.



'A' is

a) H_3PO_2 and H_2O b) H^+ / H_2O

c) $HgSO_4 / H_2SO_4$ d) Cu_2Cl_2

13. $C_6H_5NO_2 \xrightarrow{Fe / HCl} A \xrightarrow[273K]{NaNO_2 / HCl} B \xrightarrow[283K]{H_2O} C$ 'C' is

a) $C_6H_5 - OH$ b) $C_6H_5 - CH_2OH$

c) $C_6H_5 - CHO$ d) $C_6H_5NH_2$

14. Nitrobenzene on reaction with Con.HNO_3 / H_2SO_4at 80-100°C forms which one of the following products? a) 1,4 – dinitrobenzene b) 2,4,6 – tirnitrobenzene

c) 1,2 – dinitrobenzene d) 1,3 – dinitrobenzene

15. C_5H_{13} N reacts with HNO_2 to give an optically active compound – The compound is

a) pentan – 1- amine b) pentan – 2- amine

c) N,N – dimethylpropan -2-amine d) N – methylbutan – 2-amine

16. Secondary nitro alkanes react with nitrous acid to form

a) red solution b) blue solution c) green solution d) yellow solution

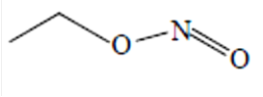
17. Which of the following amines does not undergo acetylation?

a) t – butylamine b) ethylamine c) diethylamine d) triethylamine

18. Which one of the following is most basic?

a) 2,4 – dichloroaniline b) 2,4 – dimethyl aniline

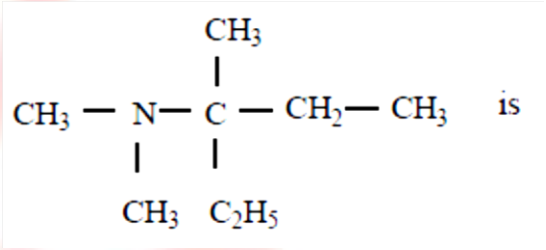
c) 2,4 – dinitroaniline d) 2,4 – dibromoaniline

19. When  is reduced with Sn / HCl the pair of compounds formed are

a) Ethanol, hydrozylamine hydrochloride b) Ethanol, ammonium hydroxide

c) Ethanol, .NH_2OH d) $C_3 H_5 NH_2$, $H_2 O$

20. IUPAC name for the amine

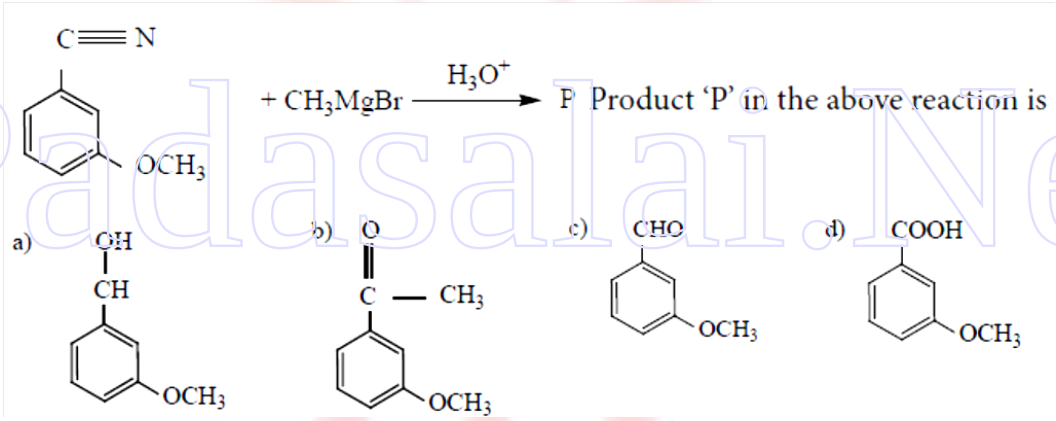
 is

a) 3 – Bimethylamino – 3 – methyl pentane

b) 3 (N,N – Triethyl) – 3- amino pentane

c) 3 – N,N – trimethyl pentanamine

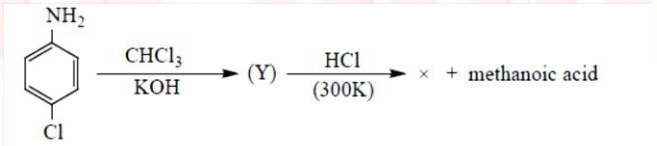
d) 3 – (N,N – Dimethyl amino) – 3- methyl pentane

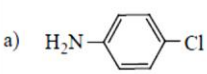
21. 

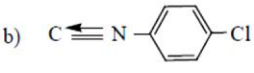
22. Ammonium salt of benzoic acid is heated strongly with $P_2O_5$and the product so formed is reduced and then treated with $NaNO_2$ / HCl at low temperature. The final compound formed is a) Benzene diazonium chloride b) Benzyl alcohol

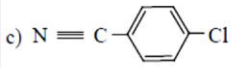
c) Phenol d) Nitrosobenzene

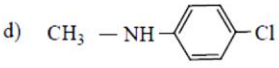
23. Identify X in the sequence give below.



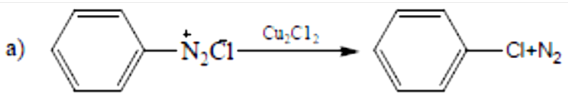
a) 

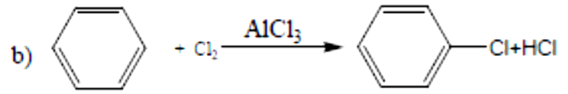
b) 

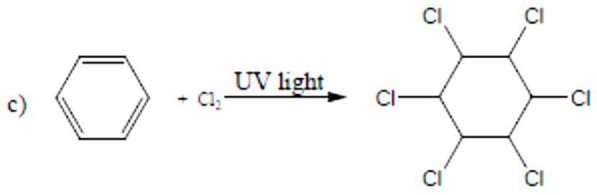
c) 

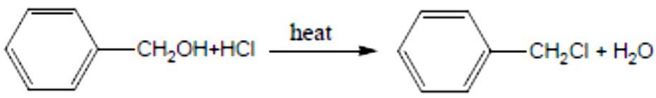
d) 

24. Among the following, the reaction that proceeds through an electrophilic substitution, is :

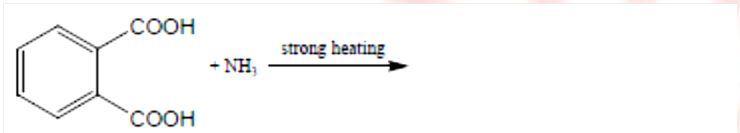
a) 

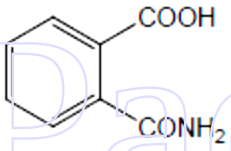
b) 

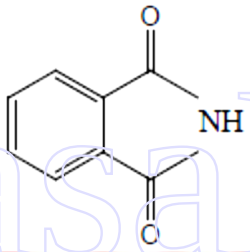
c) 

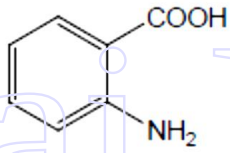
d) 

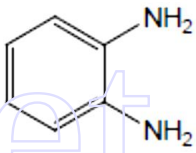
25. The major product of the following reaction



a) 

b) 

c) 

d) 

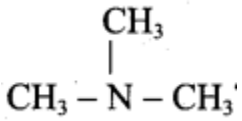
Additional Questions :

1. Which one of the following is act as neurotransmitter?
   (a) Pyridoxine (b) Histamine (c) Dopamine (d) Cyano cobalamine
2. Which one of the following is an example of primary nitro alkane?
   (a) 2 – nitropropane (b) Ethyl nitrite (c) Nitro ethane (d) 2 – methyl – 2 – nitropropane
3. Nitro methane and methyl nitrite are the examples of ……
   (a) Position isomerism (b) chain isomerism (c) metarnersm (d) Tautomerism
4. Which of the following is called oil of mirbane?
   (a) Nitro methane (b) Nitro propane (c) Nitro benzene (d) Nitro ethane
5. On direct nitration of nitro benzene gives ……
   (a) 0 – dinitro benzene (b) m – dinitro benzene
   (c) p – dinitro benzene (d) 2, 4, 6 – trinitrobenzene

6. Which one of the following is formed when nitro methane reacts with chlorine and NaOH?

(a) CH_3Cl (b) CH_3COCl (c) CCl_3NO_2 (d) $CHCl_2NO_2$

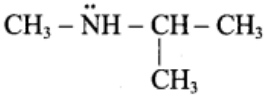
7. What is the IUPAC name of



(a) Tertiary butyl amine (b) Trimethyl amine

(c) N, N – dimethyl methanamine (d) N – methyl ethanamine

8. The IUPAC name of



(a) Methyl iso propyl amine (b) N – methyl propan – 1 – amine

(c) N, N – dimethyl methanamine (d) propan – 1 – amine

9. In which reaction acetamide is changed to methylamine by the action of Br_2/KOH?

(a) Gapriel phthalimide synthesis (b) Hoffmann degration reaction

(c) Mendius reaction (d) Mustard oil reaction

10. Which one of the reaction is used in the synthesis of aliphatic primary amines?

(a) Hoffmann ammonolysis (b) Rosenmund's reduction

(c) Carbylamine reaction (d) Gabriel phthalimide synthesis

11. The conversion of ethanol into all types of amines by the action of ammonia along with Alumina is (a) HVZ reaction (b) Sabatier -- mailhe method

(c) Carbylamine reaction (d) Mendius reaction

12. The relative basicity of amine follows the order as ……

(a) Alkyl amines > Aralkyl amines > Ammonia > N – aralkylamine > Arylamine

(b) Aralkyl amines > Ammonia > Arylamine > Alkyl amine > N – aralkylamine

(c) Arylamine Alkyl amine N – aralkylanilne

(d) N – aralkylamine < Arylamine < Ammonia < Alkyl amine < Aralkyl amine

13. Identify the name of the reaction in which aniline reacts with Benzoyl chloride to form N – Phenyl benzamide? (a) Hoffmann degradation reaction (b) Gabriel phthalimide synthesis

(c) Schotten – Baumann reaction (d) Mustard oil reaction

14. The reaction of aniline with nitrous acid at low temperature is known as ……

(a) Carbylamme reaction (b) mustard oil reaction

(c) Diazotisation (d) Sand meyer's reaction

15. Which one of the following reaction is used to identify primary amines?

(a) Schotten – Baumann reaction (b) Carbylamine reaction

(c) Sand meyer's reaction (d) Gattermann reaction

16. The reaction between methylamine and CS_2 is known as ……

(a) mustard oil reaction (b) Carbylamine reaction

(c) Sand meyer's reaction (d) Gabriel phthalirnide synthesis

17. The conversion of Benzene diazonium chloride into chlorobenzene is known as ……

(a) Gabriel phthalimide synthesis (b) Carbylamine reaction

(c) Sand meyer reaction (d) Coupling reaction

18. What is the name of the reaction in which benzene diazonium chloride react with benzene to give Biphenyl? (a) Sandmeyer's reaction (b) Gomberg reaction

(c) Gattermann reaction (d) Baltz – schiemann reaction

19. Chloropicrin is used as (a) antiseptic (b) analgesic (c) insecticide (d) fertilizer

20. Replacement of diazonium group by fluorine is known as ……..

(a) Gattennann reaction (b) Sandmeyer reaction

(c) Baltz – Schiemann reaction (d) Comberg reaction

21. Which one of the following is the strongest base in aqueous solution?

(a) Trimethyl amine (c) Dimethyl amine (d) methyl amine (b) Aniline

22. Liebermann's nitroso reaction is used for testing ……

(a) 1° amine (b) 2° amine (c) 3° amine (d) all the above

23. Carbylamine test is used in the detection of ……

(a) aliphatic 2° amine (b) Aromatic 1° amine

(c) Aliphatic l amine (d) both aliphatic and aromatic 1° amine

14. BIOMOLECULES

1. Which one of the following rotates the plane polarized light towards left?

(NEET Phase – II) a) D(+) Glucose (b) L(+) Glucose (c)D(-) Fructose d) D(+) Galactose

2. The correct corresponding order of names of four aldoses with configuration given below Respectively is, (NEET Phase – I)1551

a) *L*-Erythrose, *L*-Threose, *L*-Erythrose, *D*-Threose

b)*D*-Threose,*D*-Erythrose, *L*-Threose, *L*-Erythrose,

c)*L*-Erythrose, *L*-Threose, *D*-Erythrose, *D*-Threose

d) *D*-Erythrose, *D*-Threose, *L*-Erythrose, *L*-Threose

3. Which one given below is a non-reducing sugar? (NEET Phase – I)

a) Glucose b) Sucrose c) maltose d) Lactose.

4. Glucose(HCN) Product (hydrolysis) Product (HI + Heat) A, the compound A is

a) Heptanoic acid b) 2-Iodohexane c) Heptane d) Heptanol

5. Assertion: A solution of sucrose in water is dextrorotatory. But on hydrolysis in the presence of little hydrochloric acid, it becomes levorotatory. (AIIMS)

Reason: Sucrose hydrolysis gives unequal amounts of glucose and fructose. As a result of this change in sign of rotation is observed.

a)If both accretion and reason are true and reason is the correct explanation of assertion

b) If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) if both assertion and reason are false.

6. The central dogma of molecular genetics states that the genetic information flows from (NEET Phase – II)

a) Amino acids Protein DNA

b) DNA Carbohydrates Proteins

c) DNA RNA Proteins

d) DNA RNA Carbohydrates

7. In a protein, various amino acids liked together by (NEET Phase – I)

a) Peptide bond b) Dative bond c) α - Glycosidic bond d) β - Glycosidic bond

8. Among the following the achiral amino acid is (AIIMS)

a) 2-ethylalanine b) 2-methylglycine c) 2-hydroxymethylserine d) Tryptophan

9. The correct statement regarding RNA and DNA respectively is (NEET Phase – I)

a) the sugar component in RNA is an arabinos and the sugar component in DNA is ribose

b) the sugar component in RNA is 2'-deoxyribose and the sugar component in DNA is arabinose

c) the sugar component in RNA is an arabinose and the sugar component in DNA is 2'-deoxyribose

d) the sugar component in RNA is ribose and the sugar component in DNA is 2'-deoxyribose

10. In aqueous solution of amino acids mostly exists in, a) NH_2-CH(R)-COOH b) NH_2-CH(R)-COO c)H_3N+-CH(R)-COOH d) H_3N+-CH(R)-COO-

11. Which one of the following is not produced by body?

a) DNA b) Enzymes c) Harmones d) Vitamins

12. The number of sp2 and sp3 hybridised carbon in fructose are respectively

a) 1 and 4 b) 4 and 2 c) 5 and 1 d) 1 and 5

13. Vitamin B2 is also known as

a) Riboflavin b) Thiamine c) Nicotinamide d) Pyridoxine

14. The pyrimidine bases present in DNA are a) Cytosine and Adenine b) Cytosine and Guanine c) Cytosine and Thiamine d) Cytosine and Uracil

15. Among the following L-serine is

16. The secondary structure of a protein refers to

a) fixed configuration of the polypeptide backbone b) hydrophobic interaction

c) sequence of α-amino acids d) α-helical backbone.

17. Which of the following vitamins is water soluble?

a) Vitamin E b) Vitamin K c) Vitamin A d) Vitamin B

18. Complete hydrolysis of cellulose gives

a) L-Glucose b) D-Fructose c) D-Ribose d) D-Glucose

19. Which of the following statement is correct?

a) Ovalbumin is a simple food reserve in egg-white

b) Blood proteins thrombin and fibrinogen are involved in blood clotting

c) Denaturation makes protein more active

d) Insulin maintains the sugar level of in the human body.

20. Glucose is an aldose. Which one of the following reactions is not expected with glucose?

a) It does not form oxime b) It does not react with Grignard reagent

c) It does not form osazones d) It does not reduce tollens reagent

21. If one strand of the DNA has the sequence 'ATGCTTGA', then the sequence of complementary strand would be

a) TACGAACT b) TCCGAACT c) TACGTACT d) TACGRAGT

22. Insulin, a hormone chemically is

a) Fat b) Steroid c) Protein d) Carbohydrates

23. α-D (+) Glucose and β-D (+) glucose are

a) Epimers b) Anomers c) Enantiomers d) Conformational isomers

24. Which of the following are epimers

a) D(+)-Glucose and D(+)-Galactose (b) D(+)-Glucose and D(+)-Mannose

c) Neither (a) nor (b) (d) Both (a) and (b)

25. Which of the following amino acids are achiral?

a) Alanine b) Leucine c) Proline d) Glycine

ADDITIONAL QUESTIONS :

1. How many isomers are possible for glucose that have 4 asymmetric carbon atoms?

(a) 8 isomers (b) 16 isomers (c) 2 isomers (d) 4 isomers

2. How many asymmetric carbon atoms are in glucose?

(a) 4 (b) 3 (c) 2 (d) 1

3. Which one of the following will reduce Tollen's reagent and Fehling's solution?

(a) Glucose (b) Fructose (c) Sucrose (d) Maltose

4. The specific rotation of pure α and β (D) glucose are respectively.

(a) 18.7°, 112° (b) 112°, 18.7° (c) 90°, 90° (d) 120°, 20°

5. Sugar differing in configuration at an asymmetric centre is known as …….

(a) epimers (b) isomers (c) anomers (d) monomers

6. Which is the product formed when fructose undergoes partial reduction with sodium amalgam and water?

(a) Sorbital + mannitol (b) D – mannose + D – galactose

(c) Gluconic acid + saccharic acid (d) Aldehyde + ketone

7. How many asymmetric carbon atoms are present in fructose?

(a) 4 (b) 3 (c) 2 (d) 6

8. Two monosaccharides are linked by to form a disaccharide.

(a) glycosidic linkage

(b) peptide bond

(c) $-C(=O)-N(H)-$ linkage

(d) $-C(=O)-$ linkage

9. The enzyme that catalyses the hydrolysis of sucrose to glucose and fructose is …….

(a) zymase (b) invertase (c) diastase (d) maltase

10. Which one of the following is an example of non – reducing sugar?

(a) Glucose (b) Dextrose (c) Lactose (d) Sucrose

11. Which one of the following gives blue colour with amylose and purple colour with amylopectin?

(a) Tollen's reagent (b) Fehling's solution (c) Iodine solution (d) Bromic water

12. Which of the amino acid is optically inactive?

(a) Alanine (b) Valine (c) Glycine (d) Proline

13. Which one of the following is an example for globular protein?

(a) Kerating (b) Myoglobin (c) Collagen (d) Etastin

14. The chemical name of vitamin B_9 is …….

(a) biotin (b) folic acid (c) niacin (d) thiamin

15. The nucleic acid base having two possible binding sites is …….

(a) thymine (b) cytosine (c) guanine (d) adenine

16. Which one of the following is a protein hormone?

(a) Insulin (b) Androgen (c) Cortisol (d) Estrogen

17. Which one of the following is a steroid?

(a) Insulin (b) Epinephrine (c) mutin (d) Estrogen

18. A nucleotide consists of (a) base and sugar (b) base and phosphate

(c) sugar and phosphate (d) base, sugar and phosphate

19. Which one is fouñd in ATP ribonucleotide?

(a) Guanine (b) Uracil (c) Adenine (d) Inulin

20. In nucleic acid, the correct sequence is ……..

(a) base – phosphate sugar (b) phosphate – base – sugar

(c) sugar – base – phosphate (d) base – sugar – phosphate

21. In DNA, the complementary bases are

(a) Uracil and adenine; cytosine and guanine (b) Adenine and thymine; guanine and cytosine

(c) Adenine and guanine; thymine and cytosine (d) adenine and guanine; thymine and uracil

22. RNA is different from DNA because RNA contains ……

(a) Ribose sugar and tymine (b) Ribose sugar and uracil

(c) Doxyribose sugar and thymine (d) Deoxy ribose sugar and uracil

23. Haemoglobin is (a) an enzyme (b) a globular protein

(c) a vitamin (d) carbohydrate

24. The number of essential amino acid in man is …….

(a) 8 (b) 10 (c) 20 (d) 18

25. In fructose, the possible optical isomers are ……..

(a) 12 (b) 16 (c) 8 (d) 4

15. CHEMISTRY IN EVERYDAY LIFE

1. Which of the following is an analgesic?

a) Streptomycin b) Chloromycetin c) Asprin d) Penicillin

2. Dettol is the mixture of

a) Chloroxylenol and bithionol b) Chloroxylenol and α-terpineol

c) phenol and iodine d) terpineol and bithionol

3. Antiseptics and disinfectants either kill or prevent growth of microorganisms. Identify which of the following statement is not true.

a) dilute solutions of boric acid and hydrogen peroxide are strong antiseptics.

b) Disinfectants harm the living tissues.

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

d) Chlorine and iodine are used as strong disinfectants.

4. Saccharin, an artificial sweetener is manufactured from

a) cellulose b) toluene c) cyclohexene d) starch

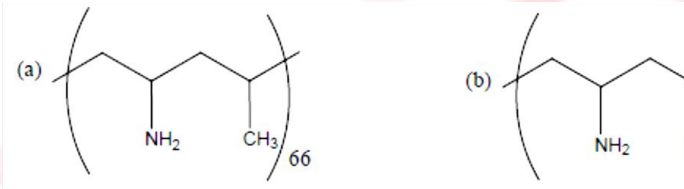
5. Drugs that bind to the receptor site and inhibit its natural function are called

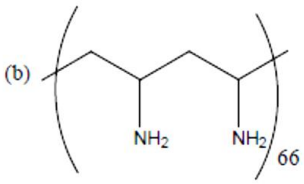
a) antagonists b) agonists c) enzymes d) molecular targets

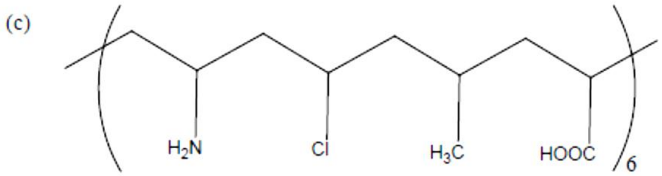
6. Aspirin is a/an a) acetylsalicylic acid b) benzoyl salicylic acid

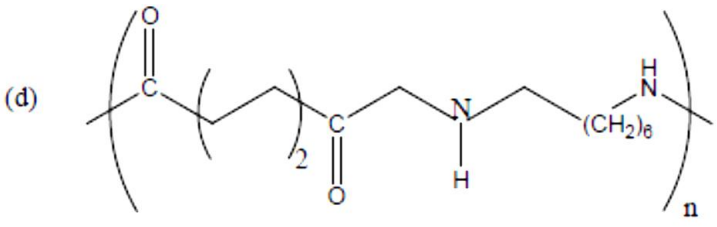
c) chlorobenzoic acid d) anthranilic acid

7. Which one of the following structures represents nylon 6,6 polymer?









8. Natural rubber has

a) alternate cis- and trans-configuration b) random cis- and trans-configuration

c) all cis-configuration d) all trans-configuration

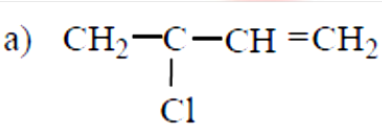
9. Nylon is an example of

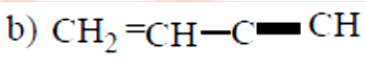
a) polyamide b) polythene c) polyester d) poly saccharide

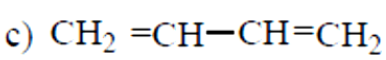
10. Terylene is an example of

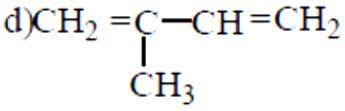
a) polyamide b) polythene c) polyester d) polysaccharide

11. Which is the monomer of neoprene in the following?

a) 

b) 

c) 

d) 

12. Which one of the following is a bio-degradable polymer?

a) HDPE b) PVC c) Nylon 6 d) PHBV

13. Non stick cook wares generally have a coating of a polymer, whose monomer is

a) ethane b) prop-2-enenitrile c) chloroethene d) 1,1,2,2-tetrafluoroethane

14. Assertion: 2-methyl-1,3-butadiene is the monomer of natural rubber

Reason: Natural rubber is formed through anionic addition polymerisation.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b) if 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.

15. An example of antifertility drug is

a) novestrol b) seldane c) salvarsan d) Chloramphenicol

16. The drug used to induce sleep is

a) paracetamol b) bithional c) chloroquine d) equanil

17. Which of the following is a co-polymer?

a) Orlon b) PVC c) Teflon d) PHBV

18. The polymer used in making blankets (artificial wool) is

a) polystyrene b) PAN c) polyester d) polythene

19. Regarding cross-linked or network polymers, which of the following statement is incorrect?

a) Examples are Bakelite and melamine

b) They are formed from bi and tri-functional monomers

c) They contain covalent bonds between various linear polymer chains

d) They contain strong covalent bonds in their polymer chain

20. A mixture of chloroxylenol and terpinecol acts as (NEET)

a) antiseptic b) antipyretic c) antibiotic d) analgesic

ADDITIONAL QUESTIONS:

1. Which one of the following is an antibiotic?

(a) erythromycin (b) atenolol (c) amiodipine (d) propranolol

2. Which one of the following is an example tbr antihypertensive drug?

(a) atenolol (b) amoxicillin (c) cefixime (d) tetracycline

3. Which one of the following inhibits the bacterial growth?

(a) p – amino benzoic acid (b) sulphanilamide (c) folic cid (d) sodium benzoate

4. Which of the following is needed by many bacteria to produce folic acid?

(a) PABA (b) DHPS (c) TNB (d) GTN

5. Which one of the following binds to the receptor site should inhibit its natural function?

(a) antacids (b) antioxidant (c) antibiotics (d) antagonists

6. Which one of the following is used as an antacid?

(a) magnesium hydroxide (b) aluminium hydroxide (c) ranitidine (d) all the above

7. Which one of the following is used as painkiller?

(a) lodoform (b) chloropicrin (c) morphine (d) coffeine

8. Which one of the following is used to treat stress, anxiety, depression, sleep disorder and schizopherenia?

(a) Tranquilizer (b) antibiotic (c) analgesic (d) opioids

9. Which one of the following is an example for tranquilizer?

(a) cimetidine (b) diazepam (c) histamine (d) PABA

10. Identify the medine that is used to treat stress, anxiety. depression and schizophrenia.

(a) valium (b) cimetidinc (c) chiorofom (d) adenosine

11. Which one of the following is used to reduce fever and prevent platelet coagulation?

(a) antibiotic (b) antiseptic (c) antioxidant (d) antipyretic

12. Which of the following are used for post operative pain and pain of terminal cancer?

(a) morphine, codeine (b) ibuprofen, aspirin

(c) methyl salicylate, salicylic acid (d) histidine, ranitidine

13. Which one of the following is an local anaesthetic?

(a) lidocaine (b) Propofol (c) iso flurane (d) ibuprofen

14. Which one of the following is an example of general anaesthetic?

(a) propofol (b) isoflurane (c) ranitidine (d) omeprazole

15. Identify the intraveneous general anaesthetics?

(a) milk of magnesia (b) lidocaine (c) omeprazole (d) iso fharane

16. Which one of the following is used to provide relief from the allergic effects?

(a) cetrizine (b) ampicillin (c) erythromycin (d) milk of magnesia

17. Which of the following is used to treat respiratory tract infections, genital, gastrointestinal tract and skin infections?

(a) ampicillin (b) penicillin (c) terfenadine (d) azithromycin

18. Which one of the following is used to reduce the risk of infection during surgery?

(a) povidone – iodine (b) ethynyles tradiol

(c) norethindrone (d) acetyl salicylic acid

19. Which one is used as preservatives for fresh vegetables and fruits?

(a) Palmitic acid (b) Palm oil (c) sodium meta suiphite (d) sulphur dioxide

20. Sodium salt of long chain allyl benzene sulphomc acids are called ……

(a) soap (b) detergent (c) disinfectant (d) antiseptic

21. Which one of the following is a natural polymer?

(a) cellulose, silk (b) PVC, Polythene (c) Buna – N, Buna – S (d) Bakelite, Nylon 6,6

22. Which one of the following catalyst is used in the preparation of high density polyethylene?

(a) benzoyi peroxide (b) zeigler natta catalyst

(c) ammonium per sulphate (d) hydrogen peroxide

23. Identify the zeiglar natta catalyst.

(a) $TiCl_4 + (C_2H_5)_3Al$ (b) $(C_2H_5)_4Pb + TiCl_4$ (c) $AlCl_3 + HCl$ (d) $ZnCl_2$ + Cone. HCl

24. Which one of the following is used as glass reinforcing material in safety helmets?

(a) nylon (b) Bakelite (c) terylene (d) orlon

25. Which one of the following is used to prepare combs and pens?

(a) navolac (b) soft Bakelite (c) hard Bakelite (d) neoprene

26. Which one of the following is used for making unbreakable crockery?

(a) phenol formal dehyde (b) melamine formal dehyde

(c) urea formal dehyde (d) navolac

27. What are the raw materials required to prepare Buna – S rubber?

(a) phenol + methanol (b) melamine + methanal

(c) styrene + butadiene (d) adipic acid + methanal

28. Which one of the following element is used in vulcanization of rubber?

(a) oxygen (b) nitrogen (c) carbon (d) sulphur

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Time + Effort=Success

ANSWER KEY

8. IONIC EQUILIBRIUM

1. (d) 5.619 x 10-12 mol3 L-3
2. (d) (iii) 75 mL M5 HCl + 25 mL M5 NaOH
3. (c) 1.08 x 10-10 mol2 L2
4. (a) 0.5 x 10-15
5. (c) OH– and F–, respectively
6. (c) 100 mL of 0.1M HCl + 200 mL of 0.1M NH4OH
7. (b) PF3
8. (a) BF3
9. (b) basic, acidic, basic
10. (b) 0.013%
11. (a) 3.7 x 10-2
12. (b) 1.6 x 10-9 M
13. (a) 2 x 10-3M
14. (d) The molar solubility of MY in water is less than that of NY3
15. (d) 12.65
16. (d) 1:10
17. (a) 9
18. (c) H3PO4
19. (c) HPO42-
20. (b) strongly acidic
21. $(a)\ [H^+] = \frac{K_a[\text{acid}]}{[\text{salt}]}$
22. C
23. (b) 5.55 x 1010

ADDITIONAL QUESTONS

1. (d) either (b) or (c)
2. (a) H_2O
3. (b) $HCl + Cl^-$
4. (b) Cr^{3+}
5. (c) 1×10^{-14}
6. (a) 3
7. (d) NaOH + NaCl
8. (a) OH^- and HSO_4
9. (c) 1.0×10^9
10. (b) 5.09
11. (c) 4
12. (d) 6.63
13. (a) 9.4
14. (c) 11
15. (a) pH will increase
16. (d) 10^{-9}
17. (a) $CH_3COOH + CH_3COONa$
18. (a) remains constant
19. (d) $mol^2\ L^{-2}$
20. (a) $[Ag^+]^2\ [CrO_4^{-2}]$
21. (c) $NH_4OH + NH_4Cl$

9. ELECTROCHEMISTRY

1. (c) 6.022 x 1022
2. (b) – 2.69 and non spontaneous
3. (c) 1.10V
4. (b) 11.52 S cm2 mol-1
5. (c) 390.7
6. (b) charge carried by one mole of electrons
7. (a) 5F
8. (b) 2
9. (b) 107.2 minutes
10. (c) 3.75 x 1020
11. (b) 0.002N
12. (c) PbSO4 on anode is reduced to Pb.
13. (a) I and IV
14. (d) Zinc has higher negative electrode potential than iron
15. (d) both assertion and reason are false.
16. (a) O2(g) + 2H2O (l) + 4e– → 4OH–(aq)
17. (b) 6.25 x 10 -6
18. (c) 1 cm-1
19. (d) 1.74 x 10-12
20. (b) E1 > E2
21. (d) HBrO
22. (a) – 46.32 KJ mol-1
23. (b) 15.8
24. (a) Y will oxidize X and not Z
25. (a) 0.80

ADDITIONAL QUESTONS

1. (c) Redox reactions
2. (b) Ω m
3. (a) Ohm metre
4. (b) Siemen (S)
5. (d) $Ohm^{-1}m^{-1}$
6. (a) $Sm^2g\ equivalent^{-1}$
7. (b) wheat stone bridge
8. (c) Debye-Huckel and Onsagar equation
9. $(b)\ \Lambda_m = \Lambda^\circ_m - \left(A + B\Lambda^\circ_m\right)\sqrt{C}$
10. (d) all the above
11. (b) Agar-Agar gel – Na_2SO_4
12. (a) either a (or) c
13. (b) 1.107 Volts
14. (b) zero
15. (c) Platinum
16. (b) – Nfe
17. (c) negative
18. (b) 96500 C
19. (a) Nernst equation
20. $(c)\ E_{cell} = E^\circ_{cell} - \frac{0.0591}{n}\log\frac{[C]^l[D]^m}{[A]^x[B]^y}$
21. (a) m = Zit
22. (b) electro chemical equivalent
23. (b) Li – ion battery
24. (b) non – rechargeable
25. (a) Zinc, Graphite rod with MnO_2
26. (b) $NH_4Cl + ZnCl_2$
27. (c) Zinc amalgamated with mercury

28. (a) HgO mixed with graphite.
29. (a) 1.35 V
30. (a) Paste of kOH and ZnO
31. (c) Lead storage battery
32. (a) Lead plate bearing PbO_2, Spongy lead
33. (c) Aqueous KOH
34. (b) $Fe_2O_3.xH_2O$
35. (c) Galvanisation
36. (c) 0.66 g

10. SURFACE CHEMISTRY

1. (c) 1/n, log k
2. (b) increases with increase in temperature
3. (d) ΔG, ΔH and ΔS all are negative.
4. (c) liquid in gas
5. (a) if both assertion and reason are true and reason is the correct explanation of assertion
6. (b) It is true, Fe3+ ions coagulate blood which is a negatively charged sol
7. (b) emulsion
8. (b) Gel – butter
9. (d) AI3+
10. (b) CH3 – (CH2)15 – NH2
11. (d) Tyndall effect-scattering of light
12. (b) III > II > I > IV
13. (a) Nitrocellulose
14. (a) Hydrolysis of sucrose in presence of all HCl
15. (a) (iv) (i) (ii) (iii)
16. (a) III > II > I
17. (a) ΔS decreases – ΔS is –ve
18. (d) x/m = mPT
19. (a) Both magnitude and sign of the charge on the ion.
20. (d) (iv) (iii) (ii) (i)

ADDITIONAL QUESTONS

1. (c) 400 kJ/mole
2. (b) (iii) only
3. (a) NH_3
4. (c) Permutit
5. (b) Silica gel
6. (c) Nickel
7. (b) Fe, Mo
8. (d) Chromatography
9. (b) Decomposition of H_2O_2 in the presence of Pt catalyst
10. (a) As_2O_3
11. (c) H_2S
12. (a) Co
13. (a) Ethanol
14. (b) activation energy
15. (c) diastase
16. (a) Fe°/Pd°
17. (c) Fog
18. (c) Bredigs arc method
19. (c) ultrasonic dispersion
20. (d) peptisation
21. (c) coagulation
22. (b) 1 mμ to 1 μm diameter
23. (d) rod like
24. (a) AS_2S_3
25. (c) scattering of light
26. (c) electrophoresis
27. (c) Electro osmosis
28. (d) Tollen's test
29. (c) Alum containing Al^{3+}
30. (a) chromium salt
31. (a) Ammoniacal $AgNO_3$
32. (d) the measure of protective power of a lyophillic colloid

11. HYDROXY COMPOUNDS AND ETHERS

1. (a) CH3 CH (OH) CH2CH3
2. (c) methyl propanoate
3. A
4. (c) 2 – chloroethan – 1 – ol and NaHCO3
5. c) 4 – nitrophenol
6. b
7. (a) Phenol
8. (c) trichloro methane (Riemer Tiemann reaction)
9. (b) (CH3)2 C = C (CH3)2
10. (a) 4 – chloro – 2, 3 – dimethyl pentan – 1 – ol
11. (a) if both assertion and reason are true and reason is the correct explanation of assertion.
12. (d) ethanol
13. (c) Williamson ether synthesis
14. (a) C6H5 – OH (phenol)
15. (a) if both assertion and reason are true and reason is the correct explanation of assertion.
16. (c) methanol
17. (d) ethan -1, 2-diol
18. (c) Kolbe reactions
19. (d) methoxy ehane
20. A
21. (b) SN2 reaction
22. (b) violet colour

ADDITIONAL QUESTONS

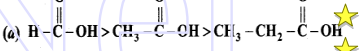
1. (d) $HO-CH_2-(CHOH)_4-CH_2OH$
2. (a) $CH_3-\underset{H}{\overset{H}{C}}-OH$
3. (c) Ethane – 1, 2 – diol
4. (a) Propan – 2 – ol
5. (b) Ethanol

6. (b) 2 – methyl – p ropan – 2 – ol
7. (c) Prop – 2 – en – 1 – Oi
8. (c) Cold dilute alkaline $KMnO_4$
9. (a) Conc. HCl + Anhydrous $ZnCl_2$
10. (c) Blue
11. (c) E_1 mechanism
12. (a) 1° < 2° < 3°
13. (b) Swern oxidation
14. (a) Esterification
15. (d) Oxirane
16. (a) 1, 4 – dioxane
17. (a) Methanal
18. (a) Nitroglycerine
19. (b) Glyceric acid and tartronic acid
20. (a) 1° alcohol > 2° alcohol > 3° alcohol
21. (c) Pyrogallol
22. (b) 1, 2 – dihydroxy benzene
23. (c) Dow's process
24. (d) Benzene
25. (b) Schotten – Baumann reaction
26. (d) 2, 4 , 6 – trinitro phenol
27. (c) Kolbe's Schmitt reaction
28. (c) Rlemer – Tiemann reaction
29. (b) Salicylaldehyde
30. (b) P – hydroxy azo benzene
31. (b) Methanal
32. (c) Methoxy benzene
33. (d) Diethyl ether
34. (c) SN^2
35. (b) P – bromoan isole
36. (b) Ethoxy ethane
37. (c) comparatively inert

12. CARBONYL COMPOUNDS

1. A
2. (d) Nucleophilic addition
3. (c) hydrazine in presence of slightly acidic solution
4. (b) Victor meyer test
5. (c) hexamethylenetetraamlne
6. A
7. (a) if both assertion and reason are true and reason is the correct explanation of assertion.
8. (a) FCH2COOH > CH3COOH > BrCH2COOH > ClCH2COOH
9. (c) benzene diazonium chloride
10. (c) Hell – Volhard – Zelinsky reaction
11. (a) acetylchloride
12. (a) formic acid
13. B
14. (a) but – 3 – enoicacid
15. D
16. A
17. (b) if both assertion and reason are true but reason is not the correct explanation of assertion.
18. (b) cannizaro reaction
19. (a) Phenylmethanal
20. (b) Fehling's solution
21. (c) phenyl methanol and sodium benzoate
22. (d) Wolf kishner reduction
23. C
24. (d) formation of intermolecular H – bonding

ADDITIONAL QUESTONS

1. (a) Prop – 2 – enal
2. (d) Rosenmund reduction
3. (b) Catalyst poison
4. (c) Gattermann koch reaction
5. (b) Benzophenone
6. (c) Anhydrous $AlCl_3$
7. (b) Hexamethylene tetramine
8. (a) Urotropine
9. (c) Nitration of urotropine
10. (c) Propane
11. (d) Cannizaro reaction
12. (c) Claisen – schmidt condensation
13. (c) Benzoin
14. (a) Peridn's reaction
15. (b) C_6H_5 CH = N – C_6H_5
16. (b) Pyridine
17. (a) lodoform test
18. (c) Paraldehyde
19. (c) CH_3COCH_3
20. (c) Hell – volhard – zelinsky reaction
21. (a) 
22. (c) F – CH_2 – COOH > Cl – CH_2COOH > Br – CH_2COOH > I – CH_2COOH
23. (b) Transesterfication
24. (c) Sodium benzoate
25. (d) Acetic anhydride
26. (d) Benzyl alcohol
27. (c) Nucleophilic addition
28. (a) $(CH_2)_6N_4$

13. ORGANIC NITROGEN COMPOUNDS

1. (a) Sn / HCl
2. (b) potassium salt of phthalimide treated with chlorobenzene followed by hydrolysis with aqueous NaOH solution
3. (a) CH3CONHCH3

4. (d) both assertion and reason are false
5. (c) methanamine
6. (c) (CH3)3CNO2 – 30 nitroalkane
7. (c) Schotten – Baumann reaction
8. (c) schiff 's base
9. B
10. (d) acetanilide
11. (d) N(CH3)2H > N(CH3)H2 > N(CH3)3 > NH3
12. (a) H3PO2 and H2O
13. (a) C6H5 – OH
14. (d) 1, 3 – dinitrobenzene
15. (d) N – methylbutan – 2 – amine
16. (b) blue solution
17. (d) triethyl amine (3°amine)
18. (b) 2, 4 – dimethyl aniline
19. (a) Ethanol, hydrozylamine hydrochloride
20. (d) 3 – (N, N – Dimethyl amino) – 3 – methyl pentane
21. B
22. (b) Benzyl alcohol
23. A
24. B
25. B

ADDITIONAL QUESTONS

1. (c) Dopamine
2. (c) Nitro ethane
3. (d) Tautomerism
4. (c) Nitro benzene
5. (b) m – dinitro benzene
6. (c) CCl_3NO_2
7. (c) N, N – dimethyl methanamine
8. (b) N – methyl propan – 1 – amine
9. (b) Hoffmann degration reaction
10. (d) Gabriel phthalimide synthesis
11. (b) Sabatier – mailhe method
12. (a) Alkyl amines > Aralkyl amines > Ammonia > N – aralkylamine > Arylamine
13. (c) Schotten – Baumann reaction
14. (c) Diazotisation
15. (b) Carbylamine reaction
16. (a) mustard oil reaction
17. (c) Sand meyer reaction
18. (b) Gomberg reaction
19. (c) insecticide
20. (c) Baltz – Schiemann reaction
21. (c) Dimethyl amine
22. (b) 2° amine
23. (d) both aliphatic and aromatic 1° amine

14. BIOMOLECULES

1. (c) D(-) Fructose
2. (d) D – Erythrose, D – Threose, L – Erythrose, L – Threose
3. (b) Sucrose
4. (a) Heptanoic acid
5. (a) If both accretion and reason are true and reason is the correct explanation of assertion
6. (c) DNA RNA Proteins
7. (a) Peptide bond
8. (c) 2 – hydroxymethylserine
9. (d) the sugar component in RNA is ribose and the sugar component in DNA is 2' – deoxyribose
10. (d) H3N+ – CH(R) – COO–
11. (d) Vitamins
12. (d) 1 and 5
13. (a) Riboflavin
14. (c) Cytosine and Thiamine
15. C
16. (d) α – helical backbone
17. (b) Vitamin K
18. (d) D – Glucose
19. (c) Denaturation makes protein more active
20. (b) It does not react with Grignard reagent
21. (a) TACGAACT
22. (c) Protein
23. (b) Anomers
24. (d) Both (a) and (b)
25. (a) Alanine

ADDITIONAL QUESTONS

1. (b) 16 isomers
2. (a) 4
3. (a) Glucose
4. (b) 112°, 18.7°
5. (a) epimers
6. (a) Sorbital + mannitol
7. (b) 3
8. (a) glycosidic linkage
9. (b) invertase
10. (d) Sucrose
11. (c) Iodine solution
12. (c) Glycine
13. (b) Myoglobin
14. (b) folic acid
15. (c) guanine
16. (a) Insulin
17. (d) Estrogen
18. (d) base, sugar and phosphate
19. (c) Adenine
20. (d) base – sugar – phosphate
21. (b) Adenine and thymine; guanine and cytosine
22. (b) Ribose sugar and uracil
23. (b) a globular protein
24. (b) 10
25. (c) 8

15. CHEMISTRY IN EVERYDAY LIFE

1. (c)Asprin
2. (b) Chioroxylenol and a – terpineol
3. (a) dilute solutions of boric acid and hydrogen peroxide are strong antiseptics
4. (b) toluene
5. (a) antagonists
6. (a) acetylsalicylic acid
7. D
8. (c) all cis – conflguration
9. (a) polyamide
10. (c) polyester
11. A
12. (d) PHBV
13. (d) 1, 1, 2, 2 – tetrafluoroethane
14. (c) assertion is true but reason is false
15. (a) novestrol
16. (d) equanil
17. (d) PHBV
18. (b) PAN
19. (d) They contain strong covalent bonds in their polymer chain
20. (a) antiseptic

ADDITIONAL QUESTONS

1. (a) erythromycin
2. (a) atenolol
3. (b) sulphanilamide
4. (a) PABA
5. (d) antagonists
6. (d) all the above
7. (c) morphine
8. (a) Tranquilizer
9. (b) diazepam
10. (a) valium
11. (d) antipyretic
12. (a) morphine, codeine
13. (a) lidocaine
14. (b) isoflurane
15. (d) iso fharane
16. (a) cetrizine
17. (d) azithromycin
18. (a) povidone – iodine
19. (c) sodium meta suiphite
20. (b) detergent
21. (a) cellulose, silk
22. (b) zeigler natta catalyst
23. (a) $TiCl_4 + (C_2H_5)_3Al$
24. (c) terylene
25. (a) navolac
26. (b) melamine formal dehyde
27. (c) styrene + butadiene
28. (d) sulphur

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Note:

- ✓ I hope this material will be useful for practice the evaluation and additional MCQ with the help of teachers.
- ✓ It will be better to give importance to the evaluation part questions then can study additional questions.
- ✓ Above average students should study text book well for creative questions
- ✓ If any mistakes or your suggestions, please send your valuable thoughts to that email to help the students
- ✓ It has been updated on January 2021

DEDICATED TO : ALL THE TEACHERS AND STUDENTS

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