21CYB101J/CHEMISTRY

UNIT -2

1. Passivity on a metal is due to
   (a) Higher EMF
   b) Lower EMF
   c) Oxide film formation
   d) stability

2.The process of gaining of electrons by metal ions with discharge of metal is called___.
   a) **De-electronation**
   b) Electronation
   c) Reduction
   d) Cathode

3. According to the convention, the Daniel cell is represented as _____
   a) Zn l $ZnSO_4$ll $CuSO_4$ l Cu, E = 1.09 volt
   b) Zn l $ZnSO_4$ll Cu l $CuSO_4$, E = 1.09 volt
   c) $ZnSO_4$ l Zn ll $CuSO_4$ l Cu, E = 1.09 volt
   d) Zn l ZnSll $CuSO_4$ l Cu, E = 1.09 volt

4. Decrease in free energy can be given by $-\Delta G$= _____
   a) nFE
   b) n/FE
   c) nF/E
   d) F/nE

5. Generally, electrode potential refers to _____
   a) Reduction potential
   b) Oxidation potential
   c) Electron potential
   d) Cannot be determined

6.The following are state functions EXCEPT
   a) H – enthalpy
   b) q – heat
   c) E – internal energy
   d) S – entropy

7. In a reversible process, the system absorbs 600KJ heat and performs 250KJ work on the surroundings. What is the increase in the internal energy of the system?
   a) 850 KJ
   b) 600KJ
   c) 350KJ
   d) 250KJ

8. Gibbs function G is given by
   a) H-TS

b) U+PV

c) E+PV

d) U-TS

9. Which of the following is the correct equation?

a) $E = E^o\ [(2.303RT)/nF]\ \log_{10}\ [H^+]$.

b) $E = E^o + [(2.303RT)/nF]\ \log_{10}\ [H^+]$.

c) $E = E^o - [(2.303RT)/nF]\ \log_{10}\ [H^+]$.

d) $E = E^o / [(2.303RT)/nF]\ \log_{10}\ [H^+]$.

10. Which thermodynamic function relates both enthalpy and entropy?

a) Helmholtz free energy

b) Internal energy

c) Work function

d) Gibbs free energy

11. If the standard hydrogen electrode is used as the reduction electrode, then the emf is given by_____.

a) $E_{red} = -E^o + (5/n)\ \log_{10}\ [H^+]$.

b) $E_{red} = -E^o - (0.0591/n)\ \log_{10}\ [H^+]$.

c) $E_{red} = E^o + (0.0591/n)\ \log_{10}\ [H^+]$.

d) $E_{red} = E^o - (0.0591/n)\ \log_{10}\ [H^+]$.

12.The rusting iron of Iron is _____.

a) Oxidation corrosion

b) Liquid metal corrosion

c) **Wet corrosion**

d) Corrosion by other gases

13. In a reversible process $\Delta_{sys} + \Delta_{surr}$ is

a. > 0

b. < 0

c. ≥ 0

d) =0

14. Which of the following is the correct criterion for a spontaneous process?

a) ΔS system-ΔS surroundings

b) ΔS surroundings>0 only

c) ΔS system+ΔS surroundings >0

d) ΔS system>0 only

15.Entropy change for a spontaneous process is

a) (-) ve

b) (+) ve

c) 0

d) Both a and b

16. In a reversible process, entropy of the system

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

17.The name of the equation showing relation between electrode potential, standard potential (E^o) and concentration of ions in solution is
a) Kohlrausch equation
b) **Nernst equation**
c) Faraday equation
d) Ohm's equation

18. Which statement is **incorrect**?
(a) At constant pressure, $\Delta H = \Delta E + P\Delta V$
(b) The thermodynamic symbol for entropy is S.
(c) Gibbs free energy is a state function.
d) For an endothermic process, ΔH is negative.

19. For the reduction of silver ions with copper metal the standard cell potential was found to be +0.46V at 25º C. The value of standard Gibbs energy, ΔG^o will be (F = 96500 C mol^{-1})

a. -44.5KJ
b. -98.0KJ
c. -89.0KJ
d. -89.0J

20. In Pourbaix diagram the redox reaction, $Fe^{2+}+2e^{-}\rightarrow Fe_{(s)}$ is
a) pH dependent
b) pH independent
c) solvent dependent
d) solvent independent

21. Anhydrous inorganic liquid metal surface in absence of moisture undergoes _____
a) Wet corrosion
b) Dry corrosion
c) Galvanic corrosion
d) Pitting corrosion

22. Which one of the following thermodynamic quantities is a state function?
A. Gibbs free energy
B. temperature
C. power
D. work

23. The correct equation is
A. $\Delta G = nF/E$
B. $\Delta G = n/FE$
C. $\Delta G = - nFE$

D. $\Delta G = F/nE$

24. Which of the following statement is correct about galvanic cell?
A. oxidation takes place at the cathode
B. reduction takes place at the cathode
C. reduction takes place at the anode
D. anode is negatively charged

25. Wet corrosion takes place on
A. anode
B. cathode
C. near cathode
D. near anode

26. Wet corrosion products are formed on
A. anode
B. cathode
C. conducting medium
D. near anode

27. Dry corrosion products are formed on
A. anode
B. cathode
C. conducting medium
D. near cathode

28. Passivation is due to formation of
A. higher EMF
B. lower EMF
C. metal oxide layer on metal
D. electrode potential

29. Total energy of a system remains constant according to
A. first law of thermodynamics
B. second law of thermodynamics
C. third law of thermodynamics
D. newton's law

30. $E = E^{o} - [(2.303RT)/nF] \log_{10} [H+]$ is the formula of ……
A. Nernst equation
B. Newton equation
C. Gibbs equation
D. Free energy equation

31. Which corrosion product is volatile in nature _____.
A. Fe_2O_3
B. MoO_3
C. Fe_3O_4
D. FeO

32. The low solubility of beryllium sulphate in water is due to _____.
A. High inflammable energy
B. Low Energy of dissociation
C. Low inflammable energy
D. Ionic bond

33.Which statement is incorrect?
A. At constant pressure, $\Delta H = \Delta E + P\Delta V$
B. The thermodynamic symbol for enthalpy is H.
C. Gibbs free energy is a state function.
D. For an endothermic process, ΔH is not positive.

34. The purpose of the salt bridge in an electrochemical cell is to _____.
A. increase electrons
B. Maintain electrical neutrality
C. decrease electrons
D. decrease electrical neutrality
35. The Gibbs free energy change in a spontaneous process is equal to the
A. heat content of the system
B. entropy changes of the system
C. work of expansion
D. useful work
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UNIT -3

1.The infinity of intermediate conformations are called?
a) Skew conformations
b) Staggered conformations
c) Eclipsed conformations
d) Gauche

2. The potential energy of n-butane is minimum for?
a) Skew conformations
b) Staggered conformations
c) Eclipsed conformations
d) Gauche

3. The potential energy of n-butane is maximum for?
a) Skew conformations
b) Staggered conformations

c) Eclipsed conformations
d) Gauche

4.The relative instability of any of the intermediate skew conformations is due to?
a) Lateral strain
b) Shear strain
c) Longitudinal strain
d) Torsional strain

5. Which of the following is least stable?
a) Anti conformation
b) Gauche conformation
c) Staggered conformation
d) Eclipsed conformation

7.Which of the following is an initiator molecule in the free radical polymerisation?
a) Benzoyl peroxide
b) Sulphuric acid
c) Potassium permanganate
d) Chromium oxide

8.Aldehydes and ketones are formed from
a) the dehydration of alcohols
b) the oxidation of alcohols.
c) the addition of nucleophiles to alkenes
d) the elimination of alcohols

9.Losing of small molecule from original organic molecule is------
a) Elimination reaction
b) Substitution reaction
c) Addition reaction
d) Both A and D

10. The rate of nucleophilic substitution reaction is higher in the presence of ____.
a) Electron withdrawing groups
b) Electron releasing groups
c) Both electron withdrawing and releasing groups
d) Initiator

11. An acceptor of pair of electrons is termed as?
a) Nucleophile
b) electrophile
c) carbocation
d)Anion

12.Identify reducing agent the following

a) OSO_4
b) PCC
c) **$LiAlH_4$**

d) $K_2Cr_2O_7$

13.Which of the following compounds will exhibit cis-trans isomerism?

a) 2-butene
b) 2-butyne
c) 2-butanol
d) Butanal

14.The isomers which can be inter converted through rotation around a single bond are:

a. conformers
b. diastereomers
c. enantiomers
d. positional isomers

15. A low concentration of nucleophile favours the

a) S_N2 mechanism
b) S_N1 mechanism
c) Both a and b
d) E1 mechanism

16.Which of the following is rate determining step in electrophilic substitution reaction?

a) Generation of electrophile
b) Attack by an electrophilic reagent on benzene ring
c) Formation of product
d) both a and c

17. Which of the following is not an optically active compound?

a) 1,7- Dicarboxylic Spiro Cycloheptane
b) 1,3- Diphenylpropadiene
c) Meso-tartaric acid
d) Glyceraldehyde

18. What type of reaction takes place upon treatment of a ketone with HCN to form a cyanohydrin?

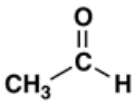
a) Nucleophilic addition
b) Nucleophilic substitution
c) Electrophilic addition
d) Electrophilic substitution

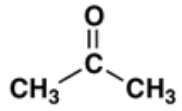
19.The dehydration of alcohols is an example of _____

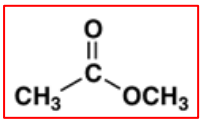
a) Bimolecular elimination/E2 reaction
b) SN2 reaction
c) SN1 reaction
d) Unimolecular elimination/E1 reaction

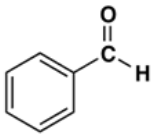
20.Which is unreactive in hydride reduction with $NaBH_4$?

a)

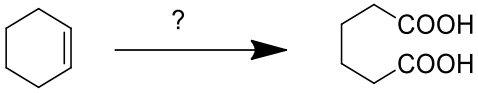


b) 

c) 

d) 

21.The most suitable reagent for the following transformation is



a) $KMnO_4$
b) OsO4
c) K2Cr2O7
d) PCC

22. Draw a Newman projection of butane (C4H10) viewed along the central C–C bond and showing the lowest energy conformation. One of the following statements describes the diagram provided it is drawn correctly. Which statement is correct?

a. The Newman projection shows two methyl groups mutually eclipsed.

b. The Newman projection shows a methyl group and an H atom mutually staggered.

c. The Newman projection shows a methyl group and an H atom mutually eclipsed.

d. The Newman projection shows two methyl groups mutually staggered.

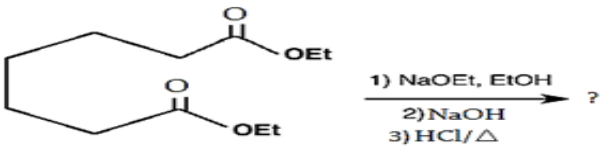
23.Which is unreactive in hydride reduction with $NaBH_4$?

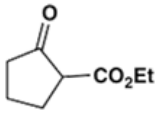
a) CH_3CHO
b) CH_3COCH_3
c) CH_3COOCH_3
d) CH_4

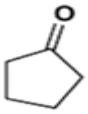
24.What is the other name for the intra-molecular Claisen condensation?

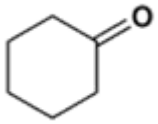
a) Perkin condensation
b) Stobbe condensation
c) Knoevenagel condensation
d) Dieckmann condensation

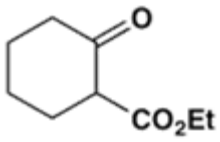
25.What will be the product of the following intramolecular Claisen condensation?



a) 

b) 

c) 

d) 

26. Cardiovascular effects can be prevented or treated [if the patients already had a heart attack or stroke] only by taking

a) Ibubruphen
b) Acetaminophen
c) Ketoprofen
d) Acetylsalicylic acid

27.Select the incorrect statement from the following option?
a) Racemic modification is an equimolar mixture of dextrorotatory and levo rotatory isomers
b) Meso compounds contains more than one chiral carbon centre
c) Meso compounds are externally compensated
d) Racemic mixture is designated as dl-pair

28. How many optical isomers are possible in a compound with one chiral carbon?
a) 5
b) 4
c) 2
d) 3

29. Antipyretics are used to
A. reduce body temperature
B. reduce vomiting
C. reduce nausea
D. increase body temperature

30. Analgesics are used to
A. reduce pain
B. reduce nausea

C. increase ache
D. increase pain

31. The chemical formula of aspirin is
A. Methoxy benzoic acid
B. Methyl Salicilate
C. Acetyl Salicillc acid
D. Phenyl Salicilate

32. The IUPAC name for paracetamol is
a) 2-Acetoxybenzoic acid
b) Monohydroxybenzene
c) N-(4-Hydroxyphenyl)acetamide
d) Phenyl Salicylate

33.Geometrical Isomerism is shown by
A. CH_2=C(Br)I
B. CH_3**CH=C(Br)I**
C. $(CH_3)_2$C=C(Cl)Br
D. $CH_3CH=CCl_2$

34. $KMnO_4$ acts as an oxidizing agent in
A. Acidic medium only
B. Neutral and acidic medium
C. Neutral and alkaline medium
D. Neutral, acidic and alkaline medium

35.The Dieckmann condensation reaction gives
A. Alkane
B. cyclic β-ketoesters
C. alocohol
D. acyclic β-ketoesters

36.Primary amines are formed upon ……of Primary amides.
A. reduction
B. oxidation
C. acylation
D. alkylation

37. The best class of drugs is based upon_____.
A. chemical structure.
B. drug action.
C. molecular targets.
D. pharmacological effect

38. Chiral molecules which are non-super-imposable mirror images of each other are called
a. Diastereomers
b. Meso compounds
c. Racemic mixture
d. Enantiomers

39. The plane which divides the molecule into two equal parts so that each half is the mirror

image of another half is called -----.

a. Centre of symmetry

b. Plane of symmetry

c. Axis of symmetry

d. Angle of symmetry

40.When a molecule has a plane of symmetry, it will be _____

a. Optically inactive

b. Optically active

c.Both optically active and optically inactive

d. Enantiomer

41. Diastereomers are

a. Geometrical isomers

b. Mirror images

c. Non-mirror images

d. Unstable molecules

42. A centre of symmetry is equivalent to_____fold alternating axis of symmetry.

a) One

b) Two

c) Three

d) Four

43. A plane of symmetry is equivalent to ---------- fold alternating axis of symmetry.

a) One

b) Two

c) Three

d) Four

44. If our eyes travel in counter clockwise direction from the ligand of highest priority to the ligand of lowest priority, the configuration is

a) R-Configuration

b) S-Configuration

c) E-Configuration

d) C-Configuration

45.According to the Cahn Ingold Prelog selection rules, the decreasing order of preference is

a) $-NH_2$> $-C_6H_5$> $-CH(CH_3)_2$> -H

b) $-CH(CH_3)_2$> $-C_6H_5$> -H> $-NH_2$

c) $-NH_2$> $-CH(CH_3)_2$> $-C_6H_5$> -H

d) $-C_6H_5$> $-CH(CH_3)_2$>$-NH_2$> -H

46. Enantiomer are not

A. Mirror image only

B. achiral

C. superimposable mirror images

D. non-specific images

47. An equal proportion of two enantiomers is called as a _____

A. cis/trans mixture
B. mirror image
C. constitutional mixture
D. racemic mixture

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