

Department: B.Sc Biotechnology

Class: F.Y. BSc.

Semester: I (A.T.K.T)

Subject: Basic Chemistry II

Sample Questions

Multiple choice Questions:

Unit I

- Which of the following statement is not true regarding pairs of enantiomers?
 - They have identical boiling points
 - They rotate the plane polarized light in opposite direction
 - They react at identical rates with chiral reagents
 - They have identical melting points
- 1-Chlorobutane and 2-chlorobutane are _____ isomer of each other.
 - Chain
 - Position
 - Functional
 - Metamer
- Newmann projection formulae obtained by projecting the molecule such that central C-C bond is _____ to plane of paper.
 - Horizontal
 - Vertical
 - Perpendicular
 - On paper
- Which of the following is true of any (S) enantiomers?
 - It rotates the plane polarized light to the right.
 - It rotates the plane polarized light to the left.
 - It is a racemic form
 - It is the mirror image of the corresponding (R)-enantiomer.
- Compounds which have the same molecular formula and same structure, but differ in arrangement of atoms in space with respect to double bond are called _____.
 - Geometrical isomer
 - Position isomer
 - Chain isomer
 - Stereoisomer
- Stereoisomers are often referred as _____.
 - Constitutional isomer
 - Conformational isomer
 - Regio isomer
 - Chain isomer
- Stereocenter are often referred as _____.
 - Chiral center
 - Isomer
 - Symmetric center

- d. Achiral center
8. The maximum number of isomer of a compound with two asymmetric carbon atoms are _____.
- 1
 - 2
 - 4
 - 8
9. Which of the following correctly represent enantiomers?
- Identical compounds
 - Superimposable mirror image
 - Non superimposable mirror image
 - diastereoisomer
10. Enantiomers have the same _____.
- Melting point
 - Boiling point
 - Heats of combustion
 - Chiral HPLC spectra
11. The dihedral angle in the eclipsed conformation of ethane is _____.
- 60
 - 180
 - 90
 - 0
12. Which one of the following is the most stable conformation of ethane?
- Staggered
 - eclipsed
 - skew
 - all are equally stable
13. Which one of the following is the least stable conformation of ethane?
- Staggered
 - Eclipsed
 - skew
 - are all equally stable
14. Flying wedge formula is also known as _____ formula.
- Projection
 - Fisher
 - Wedge dot
 - Sawhorse
15. The ability of compound to rotate the plane polarized is called _____.
- Chirality
 - Optical isomer
 - Optical activity
 - Configuration
16. The _____ of a molecule is the exact three dimensional arrangement of atoms of molecule in space.
- Conformation
 - Configuration
 - Chiral center

- d. Racemic mixture.
17. A racemic mixture is represented as _____ mixture.
- sl
 - dl
 - ml
 - ql
18. The meso isomer is optically inactive because of _____.
- External compensation
 - Internal compensation
 - Resolvation
 - Racemic mixture
19. The potential energy of ethane is minimum _____ conformation.
- eclipsed
 - staggered
 - skew
 - gauche
20. Which of the following statements regarding enantiomers not true?
- All (+) enantiomers are levorotatory
 - All (-) enantiomers are rotate plane polarized light in a counter clockwise direction
 - (+) & (-) enantiomers rotate plane polarized light in opposite direction.
 - All are enantiomers are dextro rotatory.
21. A compound whose molecules are superimposable on their mirror images even though they contain asymmetric C-atom is called _____.
- A threo compound
 - A meso compound
 - A unsymmetric compound
 - A erythro compound
22. Optical activity is exhibited by a molecule which _____.
- is asymmetric as a whole
 - contains two asymmetric centers
 - has double bond with two groups different from one another at either end
 - contains triple bond
23. A compounds whose atoms are super imposable on mirror image even though they contain asymmetric carbon atoms is called _____.
- A meso compound
 - An erythro isomer
 - A threo isomer
 - An eutectic compound
24. The definition of the epimers i.e. a pair of aldoses that differ only in configuration at the position.
- C-1
 - C-2
 - C-3
 - C-4
25. The dihedral angle between the C-H in a staggered conformation of Ethane is:
- 60
 - 120

- c. 180
 - d. 240
26. How many stereoisomers of 3-bromo-2-butanol, $\text{CH}_3\text{CH}(\text{OH})\text{CHBrCH}_3$, exist?
- a. 3
 - b. 1
 - c. 2
 - d. 4
27. How many stereoisomers of 2, 3-butanediol, $\text{CH}_3\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}_3$, exist?
- a. 3
 - b. 1
 - c. 2
 - d. 4
28. Isomerism that arises out of the difference in spatial arrangement of atoms or groups about the doubly bonded carbon atoms are called _____ .
- a. Structural Isomerism
 - b. Stereo Isomerism
 - c. Geometrical Isomerism
 - d. Optical Isomerism
29. Which among the following defines Meso forms of isomers?
- a. Meso form is optically inactive due to external compensation
 - b. The molecules of the meso isomers are chiral
 - c. It can be separated into optically active enantiometric pairs
 - d. It is single compound
30. What does a polarimeter measures?
- a. Polarity of the substance
 - b. Angle of rotation of an optical compound
 - c. Concentration of substance
 - d. P^{H} of the substance
31. Which of the following statement is not true regarding pairs of enantiomers?
- a. They have identical boiling points
 - b. They rotate the plain polarized light in opposite direction.
 - c. They react at identical rates with chiral reagent
 - d. They have identical melting po
32. The infinity of intermediate conformation are called _____ conformation.
- a. skew
 - b. eclipsed
 - c. gauche
 - d. staggered
33. The potential energy difference between staggered and eclipsed form of ethane is _____ kJmol^{-1} .
- a. 10
 - b. 9
 - c. 15
 - d. 12

Unit II

34. _____ is a process by which colloids revert back to their original colloidal state.
- Tyndall effect
 - Peptization
 - Colloidal precipitate
 - Brownian movement
35. _____ is a container that can withstand very high temperature.
- Filter paper
 - Crucible
 - Tripod
 - Conical flask
36. _____ the impurity which is normally insoluble also gets precipitated along with the main precipitate.
- Post precipitation
 - Co-precipitation
 - Digestion
 - Simultaneous precipitation
37. When the precipitate is heated in the temperature of 250° - 1200° C it is known as _____.
- Drying
 - Ignition
 - Incineration
 - Ageing
38. Due to the process of digestion, the filterability and the purity of the precipitate _____.
- Filtration
 - Drying
 - Digestion
 - Ageing
39. _____ is defined as the solution for which the exact strength or concentration is known.
- Standard solution
 - Normal solution
 - Concentrated solution
 - Dilute solution
40. Due to process of _____, the filterability and the purity of the precipitate increases.
- Filtration
 - Digestion
 - Ageing
 - Drying
41. When the particles collect together to form large size particles, the process is called _____.
- Peptization

- b. Precipitation
 - c. Coagulation
 - d. Nucleation
42. Ostwald's ripening is occurring while _____ .
- a. Filtration
 - b. Precipitation
 - c. Dissolution
 - d. Digestion
43. In precipitation titration indicator used as _____ .
- a. Absorption indicator
 - b. Self indicator
 - c. Adsorption indicator
 - d. External indicator
44. In the method of coagulation colloidal particles are move and attached to each other when they collide by _____ .
- a. Filtration
 - b. Heating
 - c. Washing
 - d. Drying
45. Colloidal particle to be separated in which type of process _____ .
- a. Filtration
 - b. Drying
 - c. Saturation
 - d. Ignition
46. In the method of coagulation colloidal particles are move and attached to each other when they collide by _____ .
- a. Filtration
 - b. Heating
 - c. Washing
 - d. Drying
47. What is the unit operation sequence in gravimetric analysis?
- a. Precipitation, digestion, filtration, drying
 - b. Precipitation, filtration, washing, drying
 - c. Precipitation, digestion, washing, filtration, drying
 - d. Precipitation, washing, filtration, digestion
48. Gravimetric is one of a few analytical methods that do not standard solution as the _____ of precipitate.
- a. Weighing
 - b. Washing
 - c. Drying
 - d. Filtration
49. The colloidal state has particle size ranging from _____ nm to _____ nm.
- a. 10^{-9} to 10^{-6}
 - b. 10^{-5} to 10^{-4}
 - c. 10^8 to 10^6
 - d. 10^6 to 10^4

50. Before choosing an indicator it is necessary to know the _____ at equivalence point of the titration.
- concentration
 - p^H
 - colour
 - density
51. Which analytical method is based on the weight of the precipitate?
- Acid base titration
 - Complexometric Titration
 - Precipitation titration
 - Gravimetry
52. How many types of gravimetric analysis?
- One
 - Two
 - Three
 - Four
53. Zigzag movement of colloidal particle in colloidal solution this is a _____.
- Tyndall effect
 - Brownian movement
 - X ray diffraction
 - Fluorescence
54. Complexometric titration are useful for the determination of _____.
- Non metal ion.
 - Basic drug
 - Metal ion
 - Acidic drug
55. EDTA is a _____ ligand.
- Tetradentate ligand
 - Hexadentate ligand
 - Octadentate ligand
 - Pentadentate ligand
56. Difference between the equivalence point and the end point of the titration is known as the _____.
- Titration curve
 - Titration error
 - Titration
 - Titrant
57. Example of two color indicator _____.
- Methyl orange
 - Phenolphthalein
 - Thymolphthalene
 - Phenol red
58. Phenolphthalein is _____ color indicator.
- Two
 - Three
 - One
 - Four
59. Phenolphthalein is not a good indicator for titrating _____.

- a. NaOH Vs Oxalic acid
 - b. FeSO₄ Vs KMnO₄
 - c. NaOH Vs HCL
 - d. NaOH Vs H₂SO₄
60. Properties of primary standard for use in acid base titration include _____ .
- a. Reactive with oxygen and low molecular mass
 - b. Low molar mass and low solubility
 - c. High purity and low solubility
 - d. Stability and high purity
61. The end point of titration is marked by a _____ change in the reaction mixture.
- a. P^H
 - b. Colour
 - c. Odour
 - d. Concentration
62. The quantity of chemical in each liter of solution is known as _____ .
- a. Normality
 - b. Strength
 - c. Molecular weight
 - d. Equivalent weight
63. The p^H of the titration mixture for strong acid and strong base titration at equivalence point is
- a. 7
 - b. 4
 - c. 2.7
 - d. 9.2
64. In precipitation titration indicator used as _____ .
- a. Absorption indicator
 - b. Self indicator
 - c. Adsorption indicator
 - d. External indicator
65. In neutralization titration, acid reacts with base to form _____ .
- a. Salt and water
 - b. Salt and acid
 - c. Neutral solution
 - d. Concentrated solution
66. Addition of titrant from burette into titration flask till titrant react completely is known as _____ .
- a. Titrand
 - b. Titration
 - c. Titrant
 - d. Indicator
67. In titration end point can be detected by change in colour by _____ .
- a. Measureing cylinder
 - b. Burette
 - c. Instrument
 - d. Indicator

Unit III

68. In which of the following type of paper, chromatography does the mobile phase move horizontally over a circular sheet of paper?
- Ascending paper chromatography
 - Descending paper chromatography
 - Radial paper chromatography
 - Ascending descending paper chromatography
69. In ascending – descending chromatography eluant filled in the closed jar is _____ .
- Mixture of gases
 - Mixture of solids
 - Mixture of a liquid and a gas
 - Mixture of liquids
70. Distillate formed after distillation is _____ .
- Diluted solution
 - Impure solution
 - Condensed solution
 - Concentrated solution
71. This is not separated by distillation _____ .
- Chloroform and aniline
 - Milk and water
 - Impurities in sea water
 - Acetone and water
72. _____ is a process of separating the component substance from a liquid mixture by selective evaporation and condensation.
- Crystallisation
 - Distillation
 - Sublimation
 - Chromatography
73. Ion-exchange resin is _____ .
- Crystallisation Linear
 - Low molecular weight
 - Organic polymer with porous structure
 - Soluble
74. Which of the following ion get released from the cation exchange column?
- H^+
 - Na^+
 - K^+
 - Ca^+
75. Ion-free water coming out from the exchanger is known as _____ .
- Potable water
 - Disinfected water
 - Coagulated water

- d. Demineralised water
76. Thin layer chromatography is _____ .
- partition chromatography
 - Mixture of liquid and an insoluble substance electrical mobility of ionic species
 - Adsorption chromatography
 - Partition chromatography
77. The process of distillation is used for the liquids having _____
- Sufficient difference in their boiling point
 - Sufficient difference in their melting point
 - Sufficient difference in their solubility
 - Sufficient difference in their density
78. Lambert's law states that the intensity of light decreases with respect to _____ .
- Concentration
 - Distance
 - Composition
 - Volume
79. Which of the following cannot be used as adsorbent in Column adsorption chromatography?
- Magnesium oxide
 - Silica gel
 - Activated alumina
 - Potassium permanganate
80. In which of the following type of paper, chromatography does the mobile phase move horizontally over a circular sheet of paper?.
- Ascending paper chromatography
 - Descending paper chromatography
 - Radial paper chromatography
 - Ascending – descending chromatography
81. Ion exchange chromatography is based on _____ .
- Electrostatic attraction
 - Electrical mobility of ion exchange
 - Adsorption chromatography
 - Partition chromatography
82. Ion exchange chromatography is used for the separation of _____ .
- Polar
 - Non polar
 - polar and non polar
 - Non ionic
83. What is the unit of absorbance which can be derived from Beer's- Lambert's law?
- $L \text{ mol}^{-1} \text{ cm}^{-1}$
 - Meter
 - Cm
 - No unit
84. In TLC, initially the sample is _____ .
- In contact with mobile phase
 - Not in contact with mobile phase

- c. Coated at the level of mobile phase
 - d. Coated below the mobile phase
85. In the equation, $A = \epsilon bc$, what quantity is represented by " ϵ " ?
- a. Absorbivity
 - b. Conductance
 - c. Molar absorbivity
 - d. Path length
86. Beer Lambert's law gives the relation between which of the following?
- a. Reflected radiation and concentration
 - b. Scattered radiation and concentration
 - c. Energy absorption and concentration
 - d. Energy absorption and reflected radiation
87. The principle on which thin layer chromatography is based is that the _____ .
- a. Different compounds are adsorbed on an adsorbent to different degrees
 - b. Different compounds are adsorbed on an adsorbent to same degrees
 - c. Different compounds are adsorbed on an adsorbent to different degrees
 - d. Different compounds are adsorbed on an adsorbent to same degrees
88. Which of the following is not the application of filtration?
- a. Temperature
 - b. Density
 - c. Viscosity
 - d. pH
89. Which of the following process is used to separate insoluble particles from liquids?
- a. Filtration
 - b. Extraction
 - c. Drying
 - d. Sieving
90. Precipitation is applicable for what types of solutes?
- a. Insoluble
 - b. Soluble
 - c. Sparingly Soluble
 - d. Polar solvent
91. Colorimeter is applied only in relation to _____ .
- a. UV
 - b. X-ray
 - c. IR
 - d. Visible
92. Amino acids detected by spraying the plate with ninhydrin solution is an example of _____ .
- a. Column chromatography
 - b. Thin layer chromatography
 - c. Paper chromatography
 - d. Liquid chromatography
93. Retardation factor is the ratio of _____ .
- a. Distance moved by substance from base line to distance moved by the solvent from base line

- b. Distance moved by solvent from base line to distance moved by the substance from base line
 - c. Distance moved by substance from top line to distance moved by the solvent from top line
 - d. Distance moved by solvent from top line to distance moved by the substance from top line
94. Which type of chromatography is used for the structural analysis?
- a. Column chromatography
 - b. Paper chromatography
 - c. Partition chromatography
 - d. Affinity chromatography
95. The size of a thin layer of adsorbent is about _____ .
- a. 0.1mm
 - b. 0.2mm
 - c. 0.3mm
 - d. 0.4mm
96. Column chromatography is based on the principle of _____ .
- a. Ion-exchange
 - b. Exclusion principle
 - c. Differential adsorption
 - d. Absorption
97. Purity _____ is a process of separating the component substance from a liquid mixture by selective evaporation and condensation.
- a. Crystallisation
 - b. Distillation
 - c. Sublimation
 - d. Chromatography
98. Porcelain pieces are put into the distillation flask to avoid _____ .
- a. Overheating
 - b. Uniform boiling
 - c. Bumping of the solution
 - d. Separation of liquid
99. The distilled water collected _____ in distillation process.
- a. Receiver
 - b. Adaptor
 - c. Condenser
 - d. Round bottom flask
100. Filtration is method to separate the components of _____ .
- a. Solution
 - b. Mixture of liquid and an insoluble substance
 - c. Both a and b
 - d. Pure substance