

Department: B.Sc Biotechnology

Class: F.Y. Biotech

Semester: I

Subject: Basic ChemistryII

Sample Questions

Multiple choice Questions:

Unit I

1. The potential energy of ethane is minimum ____ conformation.
 - a. eclipsed
 - b. staggered
 - c. skew
 - d. gauche
2. Which of the following statements regarding enantiomers not true?
 - a. All (+) enantiomers are levorotatory
 - b. All (-) enantiomers rotate plane polarized light in a counter clockwise direction
 - c. (+) & (-) enantiomers rotate plane polarized light in opposite direction.
 - d. All enantiomers are dextro rotatory.
3. A compound whose molecules are super imposable on their mirror images even though they contain asymmetric C-atom is called _____.
 - a. A threo compound
 - b. A meso compound
 - c. A unsymmetric compound
 - d. A erythro compound
4. Which of the following is true of any (S) enantiomers?
 - a. It rotates the plane polarized light to the right.
 - b. It rotates the plane polarized light to the left.
 - c. It is a racemic form.
 - d. It is the mirror image of the corresponding (R)-enantiomer.
5. 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 _____.
 - a. Geometrical isomer
 - b. Position isomer
 - c. Chain isomer
 - d. Stereoisomer
6. Which of the following statement is not true regarding pairs of enantiomers?
 - a. They have identical boiling points
 - b. They rotate the plane polarized light in opposite direction
 - c. They react at identical rates with chiral reagents
 - d. They have identical melting points
7. 1-Chlorobutane and 2-chlorobutane are _____ isomer of each other.
 - a. Chain
 - b. Position
 - c. Functional

- d. Metamer
8. Newman projection formulae obtained by projecting the molecule such that central C-C bond is _____ to plane of paper.
- Horizontal
 - Vertical
 - Perpendicular
 - On paper
9. Which of the following correctly represents 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 arrangements of atoms of molecule in space.
- Conformation
 - Configuration

- c. Chiral center
 - d. Racemic mixture.
17. A racemic mixture is represented as _____ mixture.
- a. sl
 - b. dl
 - c. ml
 - d. ql
18. The meso isomer is optically inactive because of _____.
- a. External compensation
 - b. Internal compensation
 - c. Resolation
 - d. Racemic mixture
19. Optical activity is exhibited by a molecule which _____.
- a. is asymmetric as a whole
 - b. contains two asymmetric centers
 - c. has double bond with two groups different from one another at either end
 - d. contains triple bond
20. A compound whose atoms are super imposable on mirror image even though they contain asymmetric carbon atoms is called _____.
- a. A meso compound
 - b. An erythro isomer
 - c. A threo isomer
 - d. An eutectic compound
21. The definition of the epimers i.e. a pair of aldoses that differ only in configuration at the position.
- a. C-1
 - b. C-2
 - c. C-3
 - d. C-4
22. The dihedral angle between the C-H in a staggered conformation of Ethane is _____ .
- a. 60
 - b. 120
 - c. 180
 - d. 240
23. The order of stability of conformation of ethane is _____ .
- a. Eclipsed>skew>staggered
 - b. Eclipsed>staggered>skew
 - c. Staggered>skew>eclipsed
 - d. Staggered>eclipsed>skew
24. Which of the following compounds will exhibit cis -trans isomerism?
- a. 2-butene
 - b. 2-butyne
 - c. 2-butanol
 - d. butanol
25. Number of stereoisomeric forms of the compound $\text{CH}_3\text{-CH=CH-CH Br-CH}_3$
- a. 3
 - b. 6

- c. 2
 - d. 4
26. Stereoisomers are often referred as _____.
- a. Constitutional isomer
 - b. Conformational isomer
 - c. Regio isomer
 - d. Chain isomer
27. Sterocenter are often referred as _____ .
- a. Chiral center
 - b. Isomer
 - c. Symmetric center
 - d. Achiral center
28. The maximum number of isomer of a compound with two asymmetric carbon atoms are _____.
- a. 1
 - b. 2
 - c. 4
 - d. 8
29. The concept of stereochemistry is based on _____.
- a. Molecular Orbital Theory
 - b. Van't Hoff & Lebel's Theory
 - c. Free radical mechanism
 - d. S_N² Mechanism
30. The potential energy difference between staggered and eclipsed form of ethane is _____ kJmol⁻¹.
- a. 10
 - b. 9
 - c. 15
 - d. 12
31. 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
32. Which of the following is NOT true of enantiomers? They have the same.
- a. Boiling point
 - b. Melting point
 - c. Specific rotation
 - d. Density
33. The infinity of intermediate conformation are called _____ conformation.
- a. skew
 - b. eclipsed
 - c. gauche
 - d. staggered

Unit II

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

42. Due to the process of _____ the filterability and the purity of the precipitate increases.
- Filtration
 - Drying
 - Digestion
 - Ageing
43. Colloidal particle to be separated in which type of process _____.
- Filtration
 - Drying
 - Saturation
 - Ignition
44. In the method of coagulation collide particles are move and attached to each other when they collide by _____ .
- Filtration
 - Heating
 - Washing
 - Drying
45. What is the unit operation sequence in gravimetric analysis?
- Precipitation, digestion, filtrations, drying
 - Precipitation, filtrations, washing, drying
 - Precipitation, digestion, washing, filtrations, drying
 - Precipitation, washing, filtrations, digestion
46. Gravimetric is one of a few analytical methods that do not standard solution as the _____ of precipitate.
- Weighing
 - Washing
 - Drying
 - Filtration
47. The colloidal state has particle size ranging from _____ nm to _____ nm.
- 10^{-9} to 10^{-6}
 - 10^{-5} to 10^{-4}
 - 10^8 to 10^6
 - 10^6 to 10^4
48. Before choosing an indicator it is necessary to know the _____ at equivalence point of the titration.
- concentration
 - p^H
 - colour
 - density
49. Which analytical method is based on the weight of the precipitate?
- Acid base titration
 - Complexometric Titration
 - Precipitation titration
 - Gravimetry
50. How many types of gravimetric analysis?
- One
 - Two
 - Three

- d. Four
51. Zigzag movement of colloidal particle in colloidal solution this is a _____.
- Tyndall effect
 - Brownian movement
 - X ray diffraction
 - Fluorescence
52. Colloids are mixture of solvent and suspended particle this is the _____ .
- Colloidal state
 - Solid state
 - Gaseous state
 - Liquid state
53. Complexometric titrations are useful for the determination?
- Non metal ion.
 - Basic drug
 - Metal ions
 - Acidic drug
54. EDTA is a _____ ligand.
- Tetradentate ligand
 - Hexadentate ligand
 - Octadentate ligand
 - Pentadentate ligand
55. The p^H of the titration mixture for strong acid and strong base titration at equivalence point is ____ .
- 7
 - 4
 - 2.7
 - 9.2
56. In precipitation titration indicator used as _____ .
- Absorption indicator
 - Self indicator
 - Adsorption indicator
 - External indicator
57. In neutralization titration, acid reacts with base to form _____ .
- Salt and water
 - Salt and acid
 - Neutral solution
 - Concentrated solution
58. _____ is a process by which colloid reverts back to its original colloidal.
- Tyndall effect
 - Peptization
 - Colloidal precipitate
 - Browinian movement
59. The reagent of known concentration which is taken in burette is _____ .
- Titrand
 - Titrant

- c. Titration
 - d. End point
60. Addition of titrant from burette into titration flask till titrant react completely is _____ .
- a. Titrand
 - b. Titration
 - c. Titrant
 - d. End point
61. The solution of known concentration is _____ .
- a. Dilute solution
 - b. Concentrated solution
 - c. Dilute solution
 - d. Primary standard
62. The chemical reagent from which solution of exact concentration cannot be prepared is _____ .
- a. Secondary standard
 - b. Dilute solution
 - c. Concentrated solution
 - d. Primary standard
63. The range of methyl orange as an indicator is in between p^H is _____ .
- a. 6-8
 - b. 8-9
 - c. 3-5
 - d. 2-4
64. Phenolphthalein is not a good indicator for titrating _____ .
- a. NaOH Vs Oxalic acid
 - b. $FeSO_4$ Vs $KMnO_4$
 - c. NaOH Vs HCL
 - d. NaOH Vs H_2SO_4
65. 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
66. The end point of titration is marked by a _____ change in the reaction mixture.
- a. p^H
 - b. Color
 - c. Odour
 - d. Concentration
67. The quantity of chemical in each liter of solution is known as _____ .
- a. Normality
 - b. Strength
 - c. Molecular weight
 - d. Equivalent weight

Unit III

68. Ion-exchange resin is _____ .
- Crystallisation Linear
 - Low molecular weight
 - Organic polymer with porous structure
 - Soluble
69. . Which of the following ion get released from the cation exchange column?
- H^+
 - Na^+
 - K^+
 - Ca^+
70. Ion-free water coming out from the exchanger is known as _____ .
- Potable water
 - Disinfected water
 - Coagulated water
 - Demineralised water
71. Thin layer chromatography is _____ .
- partition chromatography
 - Mixture of liquid and an insoluble substance electrical mobility of ionic species
 - Adsorption chromatography
 - Partition chromatography
72. 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
73. The eluant filled in the closed jar is _____ .
- Mixture of gases
 - Mixture of solids
 - Mixture of a liquid and a gas
 - Mixture of liquids
74. Distillate formed after distillation is _____ .
- Diluted solution
 - Impure solution
 - Condensed solution
 - Concentrated solution
75. This is not separated by distillation _____.
- Chloroform and aniline
 - Milk and water
 - Impurities in sea water
 - Acetone and water
76. _____ 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
77. What is the unit of absorbance which can be derived from Beer's- Lambert's law?
- a. $L\ mol^{-1}\ cm^{-1}$
 - b. Meter
 - c. Cm
 - d. No unit
78. In TLC, initially the sample is_____.
- a. In contact with mobile phase
 - b. Not in contact with mobile phase
 - c. Coated at the level of mobile phase
 - d. Coated below the mobile phase
79. In the equation, $A = \epsilon bc$, what quantity is represented by " ϵ " ?
- a. Absorbitivity
 - b. Conductance
 - c. Molar absorbitivity
 - d. Path length
80. 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
81. Beer's law states that the intensity of light decreases with respect to _____ .
- a. Concentration
 - b. Distance
 - c. Composition
 - d. Volume
82. Lambert's law states that the intensity of light decreases with respect to _____ .
- a. Concentration
 - b. Distance
 - c. Composition
 - d. Volume
83. Which of the following cannot be used as adsorbent in column adsorption chromatography?
- a. Magnesium oxide
 - b. Silica gel
 - c. Activated alumina
 - d. Potassium permanganate
84. In which of the following type of paper, chromatography does the mobile phase move horizontally over a circular sheet of paper?
- a. Ascending paper chromatography
 - b. Descending paper chromatography
 - c. Radial paper chromatography
 - d. Ascending – descending chromatography

85. Ion exchange chromatography is based on _____ .
- Electrostatic attraction
 - Electrical mobility of ion exchange
 - Adsorption chromatography
 - Partition chromatography
86. Ion exchange chromatography is used for the separation of _____ .
- Polar
 - Non polar
 - Both polar and non polar
 - Non ionic
87. Amino acids detected by spraying the plate with ninhydrin solution are an example of _____ .
- Column chromatography
 - Thin layer chromatography
 - Paper chromatography
 - Liquid chromatography
88. Retardation factor is the ratio of _____ .
- Distance moved by substance from base line to distance moved by the solvent from base line
 - Distance moved by solvent from base line to distance moved by the substance from base line
 - Distance moved by substance from top line to distance moved by the solvent from top line
 - Distance moved by solvent from top line to distance moved by the substance from top line
89. Which type of chromatography is used for the structural analysis?
- Column chromatography
 - Paper chromatography
 - Partition chromatography
 - Affinity chromatography
90. The principle on which thin layer chromatography is based is that the _____
- Different compounds are absorbed on an adsorbent to different degrees
 - Different compounds are absorbed on an adsorbent to same degrees
 - Different compounds are adsorbed on an adsorbent to different degrees
 - Different compounds are adsorbed on an adsorbent to same degrees
91. Which of the following is not the application of filtration?
- Temperature
 - Density
 - Viscosity
 - pH
92. Which of the following process is used to separate insoluble particles from liquids?
- Filtration
 - Extraction
 - Drying
 - Sieving
93. Precipitation is applicable for what types of solutes?
- Insoluble
 - Soluble
 - Sparingly Soluble
 - Both insoluble and soluble

94. Colorimeter is applied only in relation to _____.
- UV
 - X-ray
 - IR
 - Visible
95. _____ is a process of separating the component substance from a liquid mixture by selective evaporation and condensation.
- Crystallisation
 - Distillation
 - Sublimation
 - Chromatography
96. Porcelain pieces are put into the distillation flask to avoid _____.
- Overheating
 - Uniform boiling
 - Bumping of the solution
 - Separation of liquid
97. The distilled water collected _____ in distillation process.
- Receiver
 - Adaptor
 - Condenser
 - Round bottom flask
98. Filtration is method to separate the components of _____.
- Solution
 - Mixture of liquid and an insoluble substance
 - Both a and b
 - Pure substance
99. Solvent extraction is more effective when the extraction is repeated with _____.
- Extra solvent
 - Large solvent
 - Small solvent
 - No solvent
100. The relative rate of the movement of solvent and solute is expressed by a term _____.
- Rf
 - RI
 - K
 - It