

MULTIPLE CHOICE QUESTIONS

DEPARTMENT OF CHEMISTRY
University of Agriculture, Faisalabad

- Which one of the following is equal to the pK_a of a weak acid
 - Its relative molecular mass
 - The pH of a solution containing equal amounts of the acid and its conjugate base
 - The equilibrium concentration of its conjugate base
 - The pK_b of its conjugate base
- 3-bromocyclohexene is formed by bromination of cyclohexene with
 - Br_2 with CCl_4
 - N-Bromo Succinimide
 - Br_2 with benzene
 - HBr
- When Propene react with HBr gives ----- major product
 - 1-Bromopropane
 - 2-Bromopropane
 - 1-Bromopropene
 - 1,2-Bromopropene
- When Propene react with HBr and peroxide gives ----- major product
 - 1-Bromopropane
 - 2-Bromopropane
 - 1-Bromopropene
 - 1,2-Bromopropene
- What reactive intermediate is formed when diazomethane is heated?
 - Carbanion
 - Carbene
 - Carbocation
 - Carbon radical
- The products of the benzaldehyde and NaOH reaction is
 - Benzyl alcohol
 - Benzyl amine
 - Benzyl ether
 - Benzyl phenol
- Which of the following will not undergo an aldol condensation reaction

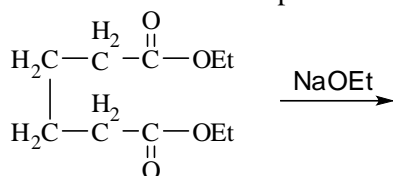
- A) Butanal
 - B) 2-methyl butanal
 - C) 2,2-dimethyl butanal
 - D) None
8. What differentiates between aldol and Claisen condensation

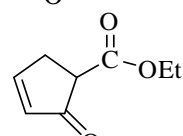
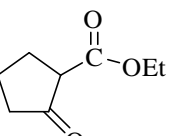
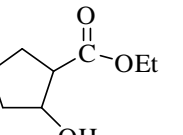
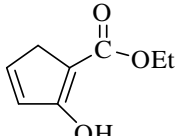
- A) Basic condition
- B) enolate ion formation
- C) tetrahedral intermediate
- D) Protonation of the intermediate

9. _____ will produce a five membered ring via a Dieckmann cyclization

- A) 1,6-diester
- B) 1,6-diketone
- C) 1,7-diester
- D) a & c

10. Select the product of the reaction



- A) 
- B) 
- C) 
- D) 

11. Benzophenone does not undergo aldol self-condensation because it has

- A) no α -carbon
- B) no α -hydrogen
- C) α -hydrogen
- D) none

12. Specify the reagents used in Knoevenagel condensation

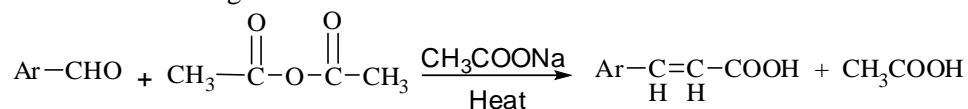
- A) RNH_2 /Pyridine
- B) R_3N /pyridine
- C) R_3N /acetone
- D) KOH /pyridine

13. $\text{Na}/\text{liq. NH}_3$ aid in partial reduction of alkyne to

- A) Cis alkene

- B) trans alkene
- C) both products
- D) None

14. Name the following Condensation reaction



- A) Darzen
- B) Perkin
- C) Aldol Condensation
- D) Stobbe

15. The ester analogue of the Aldol condensation is

- A) Darzen condensation
- B) Knoevenagel condensation
- C) Perkin condensation
- D) None

16. Which product is obtained when benzoic acid is reacted with LiAlH_4

- A) Benzaldehyde
- B) Toluene
- C) Benzene
- D) Benzyl alcohol

17. Lead tetra acetate (LTA) commonly used for oxidative cleavage of

- A) 1,2 diol
- B) 1,2 diketones
- C) 1,1 diols
- D) 1,1 diones

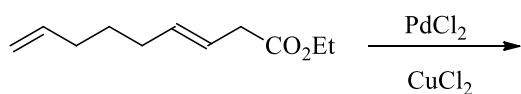
18. Preferable oxidizing agent for water soluble polyfunctional compounds such as carbohydrates and amino acids

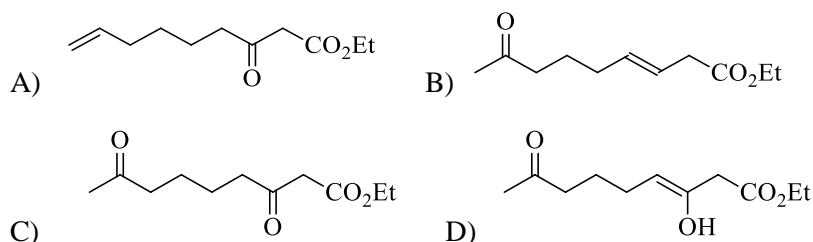
- A) Periodate reagents
- B) LTA $\text{Pb}(\text{OAc})_4$
- C) $\text{K}_2\text{Cr}_2\text{O}_4$
- D) KMnO_4

19. Oxidation states of formaldehyde is

- A) 0
- B) +1
- C) -1
- D) +2

20. The oxidation of following compound will yield





21. In the reaction of cyclohexanol with Chromium species

- A) Axial OH oxidize more rapidly than equatorial
- B) Equatorial OH oxidize more rapidly than Axial
- C) Same rate of reaction
- D) Does not oxidize

22. Which one of the following is Swern oxidizing reagent?

- A) DMSO, H_3PO_4
- B) DMSO, COCl_2
- C) DMSO, O_2
- D) DMSO, $(\text{CF}_3\text{CO})_2\text{O}$

23. Nef oxidation is used to oxidize

- A) Primary & Sec. Nitro compounds
- B) Primary & Sec. alcohols
- C) Cleavage of tertiary alcohols
- D) Terminal alkenes

24. Which one of the following is not oxidizing agent

- A) Dioxygen
- B) Bromine solution
- C) Potassium manganate
- D) Potassium iodide

25. Hydrogen acts as a reducing agent and thus resembles

- A) Halogen
- B) Noble gases
- C) radioactive elements
- D) alkali metals

26. During the oxidation with Potassium Dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$), Chromium (VI) becomes reduced to

- A) Chromium (III)
- B) Chromium (IV)
- C) Chromium (V)
- D) Chromium (II)

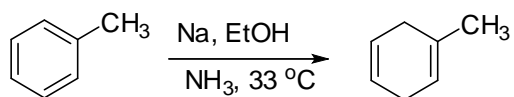
27. Oxidation involves

- A) loss of hydrogen
- B) loss of oxygen
- C) gain in hydrogen
- D) gain in electrons

28. Reduction with Potassium Iodide (KI)

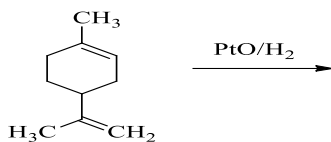
- A) iodide ion is oxidized to iodine
- B) iodide ion is reduced to iodine
- C) iodine is reduced to iodide ion
- D) iodine is oxidized to iodide ion

29. -Identify the following reaction



- A) Clemensen reduction
- B) Birch reduction
- C) Wolf Kishner reduction
- D) Clemenson reduction

30. Which one is product of following reduction?

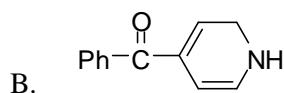
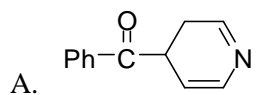
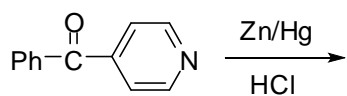


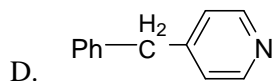
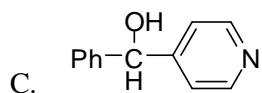
- A.
- B.
- C.
- D) a & b

31. Specify the Lindlar's catalyst

- A) Pd/CaCO₃/Quinone
- B) Pd/CaCO₃/Quinoline
- C) Pb/Ca₃CO₂/Quinone
- D) Pd/Ca₃CO₂/Quinoline

32. Which one is product of the following reaction?





33. Commonly used reducing agents for carbonyls are

- A) NaBH_4
- B) LiAlH_4
- C) a & b
- D) none

34. Which catalyst is used to produce cis alkenes?

- A) Pt
- B) Lindlar's catalyst
- C) Pd
- D) Ni

35. Number of α -Hydrogen in formaldehyde

- A) 2
- B) 1
- C) 0
- D) 3

36. Which one is Rosemund reducing agent?

- A. Pb/CaCO₃/Quinone
- B. Pd/BaSO₄
- C. Pb/CaCO₃/Quinoline
- D. Pb/Ca₂CO/Quinoline

37. Rusting of iron is an example of

- A) reduction
- B) hydrogenation
- C) oxidation
- D) sublimation

38. Process in which substance gains electrons is called

- A) oxidation
- B) hydrogenation
- C) sublimation
- D) reduction

39. Raney nickel is finally divided form of nickel is made from

- A) Nick lead alloy
- B) Nick copper alloy
- C) Nick aluminum alloy
- D) none

40. $(\text{Ph}_3\text{P})_3\text{RhCl}$ is

- A) Lindlar's catalyst
- B) Wilkinsons's catalyst
- C) Adam's catalyst
- D) Crabtree's catalyst

41. Selective oxidation of ketones in the presence of aldehydes can be carried out by

- A) Birch reductions
 - B) Luche reduction
 - C) Raney nickel
 - D) All above
42. ----- not give Hoffman rearrangement reaction.

- A) Un substituted amide
- B) Substituted amide
- C) N-bromo succinimide
- D) Primary amide

43. Beckman rearrangement yields

- A) Unsubstituted amide
- B) Substituted amide
- C) N-bromo succinimide
- D) Primary amide

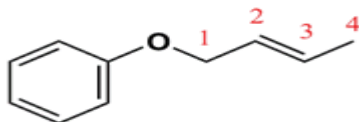
44. Vit E is lipid-----antioxidant

- A) Soluble
- B) insoluble
- C) Miscible
- D) Binding

45. Nylon is a copolymer of:

- A) Urea and Formaldehyde
- B) Phenol and Formaldehyde
- C) Hexamethylenediamine and adipic acid
- D) Vinyl Chloride and Vinylalcohol

46. Which side-chain carbon makes a new bond to the benzene ring upon Claisen rearrangement of the following allylic phenyl ether?



- A) C1
- B) C2
- C) C3
- D) C4

47. Among the following, which is least acidic?

- A) Phenol
- B) O-cresol
- C) p-nitrophenol
- D) p-chlorophenol

48. Benzyl chloride is reacted with different nucleophiles (HO^- , CH_3COO^- , PhO^- , CH_3O^-). Arrange them in the decreasing order of reactivity with Benzyl chloride.

- A) $\text{H}_3\text{O}^- > \text{HO}^- > \text{PhO}^- > \text{CH}_3\text{COO}^-$
- B) $\text{HO}^- > \text{CH}_3\text{O}^- > \text{PhO}^- > \text{CH}_3\text{COO}^-$
- C) $\text{HO}^- > \text{PhO}^- > \text{CH}_3\text{O}^- > \text{CH}_3\text{COO}^-$
- D) $\text{CH}_3\text{COO}^- > \text{CH}_3\text{O}^- > \text{HO}^- > \text{PhO}^-$

49. Which version of the radical halogenation of an alkane is MOST selective?

- A) Fluorination
- B) Chlorination

- C) Bromination
D) Iodination
50. Which one is the correct order of reactivity of different types of alcohol towards hydrogen halide?
A) 1° alcohol $>$ 2° alcohol $>$ 3° alcohol
B) 2° alcohol $>$ 1° alcohol $>$ 3° alcohol
C) 3° alcohol $>$ 1° alcohol $>$ 2° alcohol
D) 3° alcohol $>$ 2° alcohol $>$ 1° alcohol
51. Liquefied petroleum gas is mainly composed of _____
A) Methane and ethane
B) Ethane and propane
C) Propane and butane
D) Butane and hexane
52. What is the correct order of nucleophilicity in the following options?
A) $(\text{CH}_3)_3\text{CO}^- > \text{CH}_3^-$
B) $\text{CH}_3\text{S}^- > \text{CH}_3\text{SH}$
C) $\text{CH}_3\text{CH}_2\text{CH}_2\text{O}^- < (\text{CH}_3)_3\text{CO}^-$
D) $(\text{CH}_3\text{CH}_2)_3\text{N} > (\text{CH}_3\text{CH}_2)_3$
53. Which product is obtained when benzoic acid is reacted with LiAlH_4
A) Benzaldehyde
B) Toluene
C) Benzene
D) Benzyl alcohol
54. Hydrogen is good reducing agent which acts by
A) Taking oxygen
B) Giving electron
C) Both A and B
D) None
55. What is the difference in the structure between Pyrrolidine and Piperidine alkaloids?
A) Pyrrolidine is 5 membered, piperidine is 6-membered
B) Pyrrolidine is 6 membered, piperidine is 5-membered
C) Both are Five member with Nitrogen
D) Pyrrolidine is saturated, piperidine is unsaturated
56. The dehydration of alcohols is an example of _____
A) Bimolecular elimination/E2 reaction
B) $\text{SN}2$ reaction
C) $\text{SN}1$ reaction
D) Unimolecular elimination/E1 reaction
57. Which of the following is not true for $\text{SN}1$ reactions?
A) They occur through a single step concerted reaction
B) They are favored by polar solvents
C) Tertiary alkyl halides generally react through this mechanism
D) Concentration of nucleophile does not affect the rate of such reactions

58. Which of the following organic compound with molecular formula $C_3H_5Cl_2$ exhibits only one signal in the 1H NMR spectrum?

- A) 2, 2-dichloropropane
- B) 1, 2-dichloropropane
- C) 1, 3-dichloropropane
- D) 1, 1-dichloropropane

59. The order of decreasing stability of the following cations is?

(I) $CH_3C^+HCH_3$ (II) $CH_3C^+HOCH_3$ (III) $CH_3C^+HCOCH_3$

- A) III > II > I
- B) I > II > III
- C) II > I > III
- D) I > III > II

60. Which of the following is not true about nucleophile?

- A) donates an electron pair to an electrophile to form a chemical bond
- B) all molecules or ions with a free pair of electrons or at least one pi bond can act as nucleophiles
- C) nucleophile are Lewis acids by definition
- D) a nucleophile becomes attracted to a full or partial positive charge

61. Aniline reacts with acetaldehyde to form which of the following?

- A) Schiff's base
- B) Carbylamine
- C) Imine
- D) Diazonium salt

62. Which of the following statements is correct for alkyl halide?

- A) Alkyl halide will always show SN_1 mechanism
- B) As branching at carbon increases, E_1 mechanism is favoured as compared to SN_1 mechanism
- C) In unimolecular reaction, increasing the temperature donot favours E_1 mechanism
- D) In most unimolecular reactions of alkyl halide E_1 reaction is favoured over SN_1 reaction

63. Which of the following is the most activating in electrophilic aromatic substitution?

- A) $-NO_2$
- B) $-NHCOCH_3$
- C) $-CN$
- D) $-NH_2$

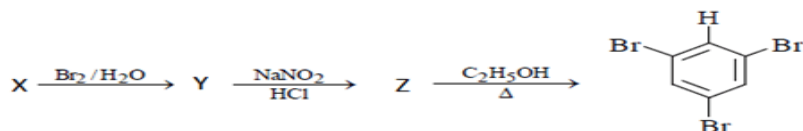
64. In NMR spectrum the distance between the centers of the peaks of doublet is called as?

- A) Coupling constant
- B) Spin constant
- C) Spin-spin coupling
- D) Chemical shift

65. Pyridine undergoes nucleophilic substitution with phenyl lithium at $100^\circ C$ to give which of the following?

- A) 3-phenylpyridine
- B) 2-phenylpyridine

- C) 3,5-diphenylpyridine
D) 2,5-diaphenylpyridine
66. Which one of the following compounds would react with $\text{C}_2\text{H}_5\text{MgBr}$ to make 3-pentanol ?
A) ethanal
B) ethyl formate
C) acetic acid
D) Acetone
67. Which of the following is not an example of a concerted reaction?
A) Diels-Alder
B) E2
C) SN1
D) SN2
68. In which condensation an enol or an enolate ion reacts with a carbonyl compound to form β -hydroxyaldehyde or β -hydroxyketone (an aldol reaction), followed by dehydration to give a conjugated enone happens?
A) Aldol condensation
B) Claisen reduction
C) Henry condensation
D) Knoevenagel condensation
69. Carbonyl compounds especially ketones undergo reduction to form _____
A) Primary alcohols
B) Secondary alcohols
C) Alkanes
D) Alkenes
70. Which types of isomers are formed in rearrangement reactions?
A) structural isomers
B) Geometrical isomers
C) Optical isomer
D) Conformational isomers
71. When ethanol is mixed with ammonia and passed over alumina the compound formed is which compound?
A) C_2H_4
B) $\text{C}_2\text{H}_5\text{NH}_2$
C) $\text{C}_2\text{H}_5\text{OC}_2\text{H}_5$
D) CH_3OCH_3
72. In the following reaction sequence, what will be X?



- A) Salicylic acid
B) Phenol
C) Aniline
D) Benzoic acid
73. The reaction of carboxylic acids with alcohols catalysed by conc. H_2SO_4 is called
A) Dehydration
B) Saponification
C) Esterification
D) Neutralization

74. Stable free radicle should have -----
- Cation
 - Anion
 - Conjugated π electron system
 - Triple bond
75. Select correct statement(s)
- All resonating structure must have same number of electron pair
 - all resonating structure should have different relative position of atoms
 - All contributing structures contribute equally in real structure
 - structure with more charge separation are more stable
76. Which statement is correct about the inductive effect?
- It operates through σ -bonds.
 - Its range is limited to one bond.
 - It operates through π -bonds.
 - It operates through space.
77. Among the following compounds, the most basic is
- Ammonia
 - methyl amine
 - dimethyl amine
 - nitro amine
78. Hoffmann rearrament is most common reaction of-----
- N-Haloamide
 - N-hydroxy amine
 - N-methyl benzamids
 - N-sulpho Amide
79. Which of the following acids is expected to have the smallest pKa value?
- $\text{CH}_2\text{ClCO}_2\text{H}$
 - $\text{CH}_3\text{CO}_2\text{H}$
 - $\text{CF}_3\text{CO}_2\text{H}$
 - $\text{CCl}_3\text{CO}_2\text{H}$
80. Rearrangement which is initiated with formation of anion is
- Hydrogen peroxide rearrangement
 - Benzil/benzylic acid rearrangement
 - Favorsiki rearrangement
 - Clasien rearrangement
81. Predict the product of the following reaction.
 $1\text{-methylcyclohexene} + \text{HBr}/\text{H}_2\text{O}_2 \rightarrow$
- 1-bromo-1-methylcyclohexane
 - 1-bromo-2-methylcyclohexane
 - 1-hydroxy-1-methylcyclohexane
 - 1-hydroxy-2-methylcyclohexane

82. +I effect shown by group
- A) COOH
 - B) CH₃
 - C) NO₂
 - D) +NR₃
83. Nitro phenol is more acidic than phenol due to the -----the nitro group
- A) +I inductive effect of
 - B) -I inductive effect
 - C) +M effect
 - D) -M effect
84. Which of the following reactions are favoured by polar aprotic solvent?
- A) S_N1 reactions
 - B) S_N2 reactions
 - C) Both S_N1 and S_N2 reactions
 - D) None of the mentioned
85. The product formed predominantly in the reaction of toluene with chlorine in the presence of FeCl₃ is
- A) *m*-chlorotoluene
 - B) *o*- and *p*-chlorotoluene
 - C) Benzoyl chloride
 - D) Benzyl chloride
86. Which of the following alcohols would be oxidised to propan-2-one?
- A) ethanol
 - B) propan-2-ol
 - C) 2-methylpropan-2-ol
 - D) Butan-1-ol
87. Dehydrohalogenation of 2-bromo-2methyl pentane give major product----
- A) 2-methyl 2-butene
 - B) 2-methyl-2-pentene
 - C) 2-methyl-1-pentene
 - D) 2-methyl-1 butene
88. Ozonolysis of benzene produces
- A) Glycol
 - B) Glyoxal
 - C) Vicinal diol
 - D) Both B & C
89. Which one of the following halide can be used in the Friedel-Crafts reaction?
- A) Isopropyl chloride
 - B) Bromobenzene
 - C) Chlorobenzene
 - D) Chloroethen
90. Which statement is true about S_N2 mechanism?
- A) The rate of reaction increases on increasing strength of the nucleophile
 - B) The reaction is faster in polar aprotic solvents
 - C) The rate of reaction increases as the leaving group ability increases
 - D) All mentioned

91. The reaction of carboxylic acids with NaHCO_3 produces _____ which helps it to differentiate it from phenols.

- A) H_2O
- B) CO
- C) CO_2
- D) NaCl

92. Which structure is that of isoprene

- A) $\text{H}_2\text{C}=\text{CH}-\text{CH}_2-\text{CH}=\text{CH}_2$
- B) $\text{CH}_3-\text{CH}(\text{CH}_3)-\text{CH}=\text{CH}_2$
- C) $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}=\text{CH}_2$
- D) $\text{H}_2\text{C}=\text{C}(\text{CH}_3)-\text{CH}=\text{CH}_2$

93. Aniline reacts with acetaldehyde to form which of the following?

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94. Which of the following is the most activating in electrophilic aromatic substitution?

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- C) $-\text{CN}$
- D) $-\text{NH}_2$

95. Which alkaloid was isolated from opium as the first crude drug?

- A) Morphine
- B) Nicotine
- C) Cocaine
- D) Caffeine

96. The three types of alkaloids are:

- A) True alkaloids, false alkaloids and neutral alkaloids
- B) Proto alkaloids, non-proto alkaloids and pseudo alkaloids
- C) True alkaloids, proto alkaloids and pseudo alkaloids
- D) Proto alkaloids, pseudo alkaloids and false alkaloids

97. The reaction of carboxylic acids with alcohols catalyzed by conc. H_2SO_4 is called

- A) Dehydration
- B) Saponification
- C) Esterification
- D) Neutralization

98. If a certain process has $\Delta S_{\text{univ}} > 0$ at 25°C , the process may be described as

- A) exothermic.
- B) endothermic.
- C) spontaneous.

D) moving rapidly toward equilibrium.

99. What term is given to the fact that the entropy of a perfect crystalline solid is zero at absolute zero?

- A) 1st law of thermodynamics
- B) 2nd law of thermodynamics
- C) 3rd law of thermodynamics
- D) crystalline lattice theory

100. The debris accompanying a mineral is called

- A) slag.
- B) gangue.
- C) ore.
- D) halite.

101. ----- is the decomposition of organic compounds into simpler compounds by the action of enzymes.

- A) Hydrogenation
- B) Fermentation
- C) Combustion
- D) Cracking

102. What is the name for spontaneous emission of particles or electromagnetic radiation by certain nuclei?

- A) Protons
- B) Isotopes
- C) Radioactivity
- D) Neutrons

103. What is Lassaigne's test extract called as?

- A) Fusion extract
- B) Sodium fusion extract
- C) Lassaigne extract
- D) Sodium extract

104. Which organic compound did Friedrich Wöhler prepare to disprove that only nature could produce organic compounds?

- A) Acetic acid
- B) Ethanol
- C) Urea
- D) Methylamine

105. Which type of isomerism is described as two compounds having the same molecular formula but different bond connectivity?

- A) Stereoisomers
- B) Geometrical isomers
- C) Constitutional isomers
- D) Conformational isomers

106. The reaction of ethylene and water yields

- A) an Aldehyde.
- B) an ester.
- C) an alcohol.

D) an ether.

107. Which is the mildest reducing agent which reduces only carbonyl group in presence of nitro, carboxyl, double bond and ester groups?

- A) LiAlH_4
- B) NaBH_4
- C) Na-NH_3
- D) $\text{H}_2\text{-Ni}$

108. A synthon can be

- A) positively charged
- B) negatively charged
- C) neutral
- D) both positively and negatively charged

109. Which of the following is the wavelength of microwave radiation region?

- A) 10-780nm
- B) 0.78-30um
- C) 0.6-10m
- D) 0.75-3.75mm

110. The electron of Nitrogen participating in the resonance in pyridine is present in which orbital?

- A) s-orbital
- B) p-orbital
- C) sp-orbital
- D) sp^2 -orbital

111. What is the change in entropy for the vaporization of 18 g of H_2O at 100°C ? At this temperature, the molar enthalpy of vaporization for water is 44.0 kJ/mol.

- A) 44 kJ/mol
- B) 440 J/K
- C) 117.9 J/K
- D) -41 kJ/K

112. Which one of the following possess highest melting point?

- A) Chlorobenzene
- B) o-dichlorobenzene
- C) m-dichlorobenzene
- D) p-dichlorobenzene

113. Which is defined as the maximum amount of solute that will dissolve in a given quantity of solvent at a specific temperature?

- A) precipitation
- B) combustion
- C) solubility
- D) super saturation

114. What is the source of UV radiation?

- A) Hydrogen gas discharge lamp
- B) RF oscillator
- C) Klystron oscillator
- D) Nernst Filament

115. Which transitions are studied by UV spectrometer?
- A) Rotational
 - B) Electronic
 - C) Nuclear
 - D) Vibrational
116. For one mole of gas C_p and C_v relations are:
- A) $C_p = C_v$
 - B) $C_p = C_v - R$
 - C) $C_p = C_v + R$
 - D) $C_p = C_v \cdot R$
117. The process of adoption of hydrogen on palladium ion is known as:
- A) Syneresis
 - B) Occlusion
 - C) Diffusion
 - D) Erosion
118. Arenes do not undergo
- A) Dehydrogenation
 - B) Coupling reaction
 - C) Halogenation
 - D) Cyclic additions
119. Which of the following are used as water repellents?
- A) Carbides
 - B) Silicon
 - C) Silicones
 - D) Silicates
120. Average kinetic energy per molecule is:
- A) $(3/2)kT$
 - B) $(3/2)RT$
 - C) $(1/2)kT$
 - D) $(1/2)RT$
121. The cell in which electrical energy is converted to chemical energy is:
- A) Galvanic cell
 - B) Voltaic cell
 - C) Electrolytic cell
 - D) Electrochemical cell
122. In an auto catalytic reaction, the rate of reaction:
- A) Increase with time
 - B) Not affected with time
 - C) Decrease with time
 - D) Can't be predicted
123. Two isotonic solutions will have same:

- A) Vapour pressure
- B) Boiling point
- C) Freezing point
- D) Osmotic pressure

124. The specific gravity of H₂SO₄ is:

- A) 1.34
- B) 1.14
- C) 1.84
- D) 1.54

125. For the respiration of sea divers, the mixture is used:

- A) He and O₂
- B) Ar and O₂
- C) Ne and O₂
- D) Kr and O₂

126. In isoelectric focusing, proteins are separated on the basis of their

- A) relative content of positively charged residue only
- B) relative content of negatively charged residue only
- C) size
- D) relative content of positively and negatively charged residue

127. Which of the following lists represent bonding interactions in their general order of strength on a "per bond" basis from lowest to highest?

- 1. hydrogen, ionic, hydrophobic, covalent
- 2. hydrogen, hydrophobic, ionic, covalent
- 3. ionic, hydrophobic, hydrogen, covalent
- 4. hydrophobic, hydrogen, ionic, covalent

128. Which of the following polymers is a condensation polymer?

- A) Polystyrene
- B) Teflon®
- C) Polyvinylchloride
- D) Nylon 66

129. Which type of Quantum Transition takes place in Ultra Violet and Visible spectroscopy?

- A) Rotation of molecules
- B) Nuclear
- C) Bonding electrons
- D) Spin of nuclei in magnetic field

130. Heating of rubber with Sulphur is known as

- A) Galvanization
- B) Vulcanization
- C) Bessemerization
- D) Sulphonation

131. Which of the following sugar give a positive result with Seliwanoff test?

- A) Sucrose

- B) Glucose
- C) Galactose
- D) Mannose

132. Which of the following principles are used in silica analyzer?

- A) Amperometry principle
- B) Colorimetric principle
- C) Coulometric principle
- D) Magnetic principle

133. Which is the best-suited method for the separation of para and ortho-nitrophenols from 1:1 mixture?

- A) crystallisation
- B) chromatography
- C) sublimation
- D) steam distillation

134. The correct order of increasing nucleophilicity is

- A) $\text{Cl}^- < \text{Br}^- < \text{I}^-$
- B) $\text{Br}^- < \text{Cl}^- < \text{I}^-$
- C) $\text{I}^- < \text{Br}^- < \text{Cl}^-$
- D) $\text{I}^- < \text{Cl}^- < \text{Br}^-$

135. How many milliliters of a 0.100 M potassium permanganate stock solution would be needed to make 100 mL of 0.0250 M potassium permanganate?

- A) 10.0 mL
- B) 4.00 mL
- C) 40.00 mL
- D) 25.0 mL

136. If two solutions are mixed together in a container and the container “feels hot”, then

- A) the reaction is endothermic.
- B) the reaction is exothermic.
- C) the energy of the universe is increased.
- D) the energy of both the system and the surroundings is decreased.

137. How many calories are in 854.3 J? (1 cal = 4.184 J)

- A) 4.897×10^{-3} cal
- B) 204.2 cal
- C) 1.171×10^{-3} cal
- D) 0.2390 cal

138. When heat is absorbed by the system and work is done by the system on the surroundings then

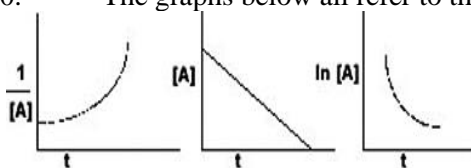
- A) q is negative and w is positive.
- B) both q and w are positive.
- C) both q and w are negative.

- D) q is positive and w is negative.
139. What is the concentration of H^+ in a $0.025\ M$ HCl solution?
A) 0
B) $0.013\ M$
C) $0.025\ M$
D) $0.050\ M$
140. The transition state of a catalyzed reaction is lower in energy than that of the uncatalyzed reaction
A) because of enthalpic interactions between the enzyme and the transition state.
B) because of favorable interactions with the substrate.
C) because of a smaller ΔS between the $[ES]$ and $[EX]$ complex.
D) both a and c are correct.
141. Macromolecule described as large molecules built up from small repeating units called as which of the following?
A) Biopolymer
B) Dimers
C) Monomers
D) Metamers
142. Which statement is *not* correct?
A) Aluminum has a low density versus other metals.
B) $Al(OH)_3$ is an amphoteric compound.
C) Metallic aluminum is toxic to humans.
D) Aluminum is very reactive with oxygen.
143. What is the molecular shape of AlF_3 ?
A) Tetrahedral
B) Linear
C) Square planar
D) Trigonal planar
144. The Downs cell is used in the production of
A) copper.
B) hydrogen.
C) magnesium.
D) sodium.
145. If a solute dissolve in an endothermic process
A) hydrogen bonds must exist between solvent and solute.
B) strong ion-dipole forces must exist in the solution.
C) the solute must be a gas.
D) the entropy of the solution must be greater than that of its pure components.
146. A solution of potassium hydroxide is in equilibrium with undissolved solute at $45^\circ C$. What will happen if the temperature is raised to $50^\circ C$? ($\Delta H_{soln} = -57.6\ kJ/mol$)
A) The mass of undissolved KOH will increase.
B) The mass of undissolved KOH will decrease.
C) The mass of undissolved KOH will be unchanged.

- D) The mass of water in the solution will increase.
147. Which among the following elements has the highest thermal conductivity?
A) Nitrogen
B) Oxygen
C) Hydrogen
D) Chlorine
148. NMR spectroscopy is used for determining structure in which of the following materials?
A) Radioactive materials
B) Insoluble chemical compounds
C) Liquids
D) Gases
149. In mass spectrometer, the ion currents are measured using which of the following?
A) Scintillation counter
B) Ion counter
C) Electrometer tube
D) Electric fields
150. The buffer capacity is equal to _____
A) $\Delta n / \Delta \text{pH}$
B) $\text{pH} / \Delta n$
C) $\pm 1\text{pKa}$
D) $\pm 2\text{pKa}$
151. What is the quantitative relationship between gas solubility and pressure?
A) Entropy
B) Henry's law
C) Enthalpy
D) Boyle's law
152. Which statement is *false*?
A) The vapor pressure of a solvent over a solution decreases as its mole fraction increases.
B) The solubility of a gas increases as the temperature decreases.
C) The vapor pressure of a solvent over a solution is less than that of pure solvent.
D) The greater the pressure of a gas over a solution, the greater its solubility.
153. What are possible units for the reaction rate?
A) $\text{L} \cdot \text{mol}^{-1} \cdot \text{s}^{-1}$
B) $\text{L}^2 \cdot \text{mol}^{-2} \cdot \text{s}^{-1}$
C) s^{-1}
D) $\text{mol} \cdot \text{L}^{-1} \cdot \text{s}^{-1}$
154. For the reaction
 $\text{BrO}_3^- + 5\text{Br}^- + 6\text{H}^+ \rightarrow 3\text{Br}_2 + 3\text{H}_2\text{O}$ at a particular time, $-\Delta[\text{BrO}_3^-]/\Delta t = 1.5 \times 10^{-2} \text{ M/s}$.
What is $-\Delta[\text{Br}^-]/\Delta t$ at the same instant?
A) 13 M/s
B) $7.5 \times 10^{-2} \text{ M/s}$
C) $1.5 \times 10^{-2} \text{ M/s}$
D) $3.0 \times 10^{-3} \text{ M/s}$

155. The reaction $A + 2B \rightarrow \text{products}$ has been found to have the rate law, $\text{rate} = k[A][B]^2$. While holding the concentration of A constant, the concentration of B is increased to three times its initial value. By what factor does the rate of reaction increase?
- A) 3
B) 6
C) 9
D) 27
156. For the hypothetical reaction $A + 3B \rightarrow 2C$, the rate should be expressed as
- A) $\text{rate} = \Delta[A]/\Delta t$.
B) $\text{rate} = -\Delta[C]/\Delta t$.
C) $\text{rate} = -3(\Delta[B]/\Delta t)$.
D) $\text{rate} = (1/2)(\Delta[C]/\Delta t)$.
157. The reaction $A + 2B \rightarrow \text{products}$ has the rate law, $\text{rate} = k[A][B]^3$. If the concentration of B is doubled while that of A is unchanged, by what factor will the rate of reaction increase?
- A) 2
B) 4
C) 6
D) 8
158. Sulfuryl chloride, $\text{SO}_2\text{Cl}_2(\text{g})$, decomposes at high temperature to form $\text{SO}_2(\text{g})$ and $\text{Cl}_2(\text{g})$. The rate constant at a certain temperature is $4.68 \times 10^{-5} \text{ s}^{-1}$. What is the order of the reaction?
- A) Zero
B) First
C) Second
D) Third
159. A certain first-order reaction $A \rightarrow B$ is 25% complete in 42 min at 25°C . What is the half-life of the reaction?
- A) 21 min
B) 42 min
C) 84 min
D) 101 min

160. The graphs below all refer to the same reaction. What is the order of this reaction?



- A) Zeroth
B) First
C) Second
D) Third
161. Which of the following sets of conditions could exist when two liquids which are completely miscible in one another are mixed?
- A) $\Delta H_{\text{soln}} > 0$, entropy of system decreases
B) $\Delta H_{\text{soln}} \approx 0$, entropy of system decreases
C) $\Delta H_{\text{soln}} \approx 0$, entropy change of system ≈ 0
D) $\Delta H_{\text{soln}} \approx 0$, entropy of system increases
162. What mass of water is required to dissolve 27.8 g of ammonium nitrate NH_4NO_3 , in order to prepare a 0.452 *m* solution?
- A) 0.0615 kg

- B) 0.100 kg
C) 0.177 kg
D) 0.768 kg
163. What states that the solubility of a gas in a liquid is proportional to the pressure of the gas over the solution?
A) Entropy
B) Henry's law
C) Dissolution
D) Vapor pressure
164. Which of the following is *not* a colligative property?
A) Vapor pressure lowering
B) Atmospheric pressure
C) Boiling point elevation
D) Osmotic pressure
165. What is the name for a solute that does not exert a vapor pressure when it is dissolved in a liquid?
A) Colloid
B) Amorphous solid
C) Nonvolatile
D) Crystalline solid
166. What relationship states that the partial pressure of a solvent over a solution is given by the vapor pressure of the pure solvent times the mole fraction of the solvent in the solution?
A) Henry's law
B) Law of partial pressures
C) Curie's law
D) Raoult's law
167. A solution is 40.00% by volume benzene (C₆H₆) in carbon tetrachloride at 20°C. The vapor pressure of pure benzene at this temperature is 74.61 mmHg and its density is 0.87865 g/cm³; the vapor pressure of pure carbon tetrachloride is 91.32 mmHg and its density is 1.5940 g/cm³. If this solution is ideal, its total vapor pressure at 20°C is
A) 84.64 mmHg.
B) 84.30 mmHg.
C) 82.96 mmHg.
D) 81.63 mmHg.
168. Calculate the pH of a buffer solution prepared by dissolving 0.20 mole of sodium cyanate (NaCNO) and 1.0 mole of cyanic acid (HCNO) in enough water to make 1.0 liter of solution. [K_a(HCNO) = 2.0 × 10⁻⁴]
A) 0.00
B) 3.00
C) 3.70
D) 4.40
169. Which may be used to prepare a buffer having a pH of 8.8?
K_a = 7 × 10⁻³ for H₃PO₄; 8 × 10⁻⁸ for H₂PO₄⁻; 5 × 10⁻¹³ for HP O₄²⁻
A) NaH₂PO₄ only
B) NaH₂PO₄ and Na₂HPO₄
C) Na₃PO₄ and Na₂HPO₄

- D) NaHPO_4 and H_3PO_4
170. How many moles of ammonia, NH_3 , are in 13.81 g of NH_3 ?
- A) 1.234 moles
 - B) 0.8107 moles
 - C) 8.316×10^{24} moles
 - D) 4.881×10^{23} moles
171. Balance the following equation: $\text{B}_2\text{O}_3(\text{s}) + \text{HF}(\text{l}) \rightarrow \text{BF}_3(\text{g}) + \text{H}_2\text{O}(\text{l})$
- A) $\text{B}_2\text{O}_3(\text{s}) + 6\text{HF}(\text{l}) \rightarrow 2\text{BF}_3(\text{g}) + 3\text{H}_2\text{O}(\text{l})$
 - B) $\text{B}_2\text{O}_3(\text{s}) + \text{H}_6\text{F}_6(\text{l}) \rightarrow \text{B}_2\text{F}_6(\text{g}) + \text{H}_6\text{O}_3(\text{l})$
 - C) $\text{B}_2\text{O}_3(\text{s}) + 2\text{HF}(\text{l}) \rightarrow 2\text{BF}_3(\text{g}) + \text{H}_2\text{O}(\text{l})$
 - D) $\text{B}_2\text{O}_3(\text{s}) + 3\text{HF}(\text{l}) \rightarrow 2\text{BF}_3(\text{g}) + 3\text{H}_2\text{O}(\text{l})$
172. Which is the thermodynamic condition for a spontaneous process at constant T and P?
- A) $\Delta S > 0$
 - B) $\Delta S < 0$
 - C) $\Delta G < 0$
 - D) $\Delta G > 0$
173. The absolute standard entropy of atom X(g) is 100 J/K • mol. Which is a reasonable value for the absolute standard entropy of $\text{X}_2(\text{g})$?
- A) 200 J/K • mol
 - B) 170 J/K • mol
 - C) 100 J/K • mol
 - D) 80 J/K • mol
174. The pressure of sulfur dioxide in a container is 159 kPa. What is this pressure in atmospheres? (1 atm = 101,325 Pa = 760 torr)?
- A) 0.209 atm
 - B) 0.637 atm
 - C) 1.57 atm
 - D) 21.2 atm
175. Which statement is correct?
- A) If $Q < K$, then products must be converted to reactants.
 - B) If $Q > K$, then reactants must be converted to products.
 - C) If $Q = K$, then the system is at equilibrium.
 - D) If $Q < K$, then more reactants are produced.
176. What is determined by the magnitude of intermolecular forces in a liquid and is a measure of a fluid's resistance to flow?
- A) Surface tension
 - B) Adhesion
 - C) Polarity
 - D) Viscosity
177. If a molecule at the surface of a liquid has enough kinetic energy to escape the liquid phase and enter the gas phase, then which of the following terms is used to describe this phenomenon?
- A) Boiling point
 - B) Condensation
 - C) Vaporization

D) Sublimation

178. Octane has a vapor pressure of 40. torr at 45.1°C and 400. torr at 104.0°C. What is its heat of vaporization? ($R = 8.314 \text{ J/K} \cdot \text{mol}$)

- A) 39.1 kJ/mol
- B) 46.0 kJ/mol
- C) 590 kJ/mol
- D) 710 kJ/mol

179. Which one of the following substances does not exist in the indicated solid type?

- A) graphite–covalent crystals
- B) Na–metallic crystals
- C) SiO₂–molecular crystals
- D) NaCl–ionic crystals

180. Which is the correct equation for the molar heat of sublimation?

- A) $\Delta H_{\text{sub}} = \Delta H_{\text{fus}} - \Delta H_{\text{vap}}$
- B) $\Delta U_{\text{sub}} = \Delta U_{\text{fus}} + \Delta U_{\text{vap}}$
- C) $\Delta H_{\text{sub}} = \Delta H_{\text{fus}} - \Delta H_{\text{vap}}$
- D) $\Delta H_{\text{sub}} = \Delta H_{\text{fus}} + \Delta H_{\text{vap}}$

181. Which statement is true about phase diagrams?

- A) Every phase diagram has only one triple point.
- B) The slope of the liquid-solid phase boundary line is typically negative.
- C) The triple point temperature is the lowest temperature where a liquid can exist.
- D) The critical temperature is lower than the triple point temperature.

182. What term is used to describe the relative arrangements of chiral carbon atoms within a polymer?

- A) Chirality
- B) Handiness
- C) Tacticity
- D) Substituents

183. _____ is study about energy of a chemical system

- A) Thermochemistry
- B) Thermodynamics
- C) chemical kinetics
- D) stoichiometry

184. Hydrophilic interactions and hydrogen bonds are types of

- A) (a) Weak chemical bonds that hold together the atoms within a molecule
- B) (b) Strong chemical bonds that hold together the atoms within a molecule

- C) (c) Weak chemical bonds that link together separate molecules
D) (d) Strong chemical bonds that link together separate molecules
185. Fats accompany high energy than simple sugars due to presence of
A) Carbon atoms
B) hydrogen atoms
C) Covalent bonds
D) hydrogen bonds
186. Polar solvent has affinity to dissolve?
A) Gasoline (heptanes& octanes)
B) Methane
C) Argon
D) sodium chloride
187. Carrier proteins
A) Transport only one substance
B) Transport more than one substance
C) Exchange one substance to another
D) Perform all of these functions
188. A lipid bilayer permits freely the mobility of
A) Urea
B) Fructose
C) Glucose
D) Potassium
189. _____ is known as the power house of the cell.
A) Nucleus
B) Cell membrane
C) Mitochondria
D) Lysosomes
190. ΔH_a for atomization of hydrogen is
A) 199 kJ/mole
B) 218 kJ/mole
C) 250 kJ/mole
D) 299 kJ/mole
191. NaOH and HCl neutralization evolve heat
A) -40.4kJ/mole
B) -50.5 kJ/mole
C) -55.5 kJ/mole

- D) -57.4 kJ/mole
192. Standard enthalpy of combustion of ethanol is
- A) -100 kJ/mole
 - B) -1250 kJ/mole
 - C) -1368 kJ/mole
 - D) -1500 kJ/mole
193. Equilibrium can exist at the reaction completed
- A) 50%
 - B) < 50%
 - C) > 50%
 - D) any of above
194. Moles of a substance per litre is known as
- A) Molar concentration
 - B) active weight
 - C) composition
 - D) concentration
195. Products and reactants are present in sufficient amount in reaction mixture when K_c is
- A) Neither very large nor very small
 - B) very small
 - C) very large
 - D) infinity
196. Concentration is taken in
- A) mol. Ml
 - B) mol/liter
 - C) g equivalent liter
 - D) g. Lit-1
197. When both forward and backward reaction proceeds at equal rate it is
- A) State of equilibrium
 - B) dynamic equilibrium
 - C) chemical equilibrium
 - D) static equilibrium
198. An example of _____ equilibrium is when evaporation rate becomes equal to rate of condensation
- A) Dynamic
 - B) chemical
 - C) static
 - D) physical

199. Dynamic equilibrium means the molar concentration of the reactants and products
- A) Becomes constant
 - B) Becomes infinitely
 - C) Decreases
 - D) increases
200. According to law of mass action rate of reaction is proportional to the product of active masses of
- A) Product
 - B) reactant
 - C) concentration
 - D) catalyst
201. When reactant and product are in same phase equilibrium is
- A) Dynamic
 - B) heterogeneous
 - C) homogenous
 - D) static
202. Equilibrium involving different phases of reactants and products is
- A) Dynamic
 - B) heterogeneous
 - C) homogenous
 - D) static
203. Multiple phases of reactant and products means a phase
- A) Homogenous
 - B) heterogamous
 - C) dynamic
 - D) static
204. A heterogeneous equilibrium means reactant and products are in
- A) Gaseous phase
 - B) liquid phase
 - C) solid phase
 - D) more than one phase
205. When a system loses some energy ΔE Carries a
- A) Negative sign
 - B) Positive sign
 - C) Neutral sign
 - D) No sign

206. Along with the average energy of reactants additional energy required for successful reaction is called
- A) Enthalpy function
 - B) Heat of reaction
 - C) effective energy
 - D) activation energy
207. A substance that alters the rate of reaction without itself being used is called
- A) Catalyst
 - B) electrolyte
 - C) acid
 - D) poison
208. A catalyst alters
- A) The direction of a reaction
 - B) The rate of a reaction
 - C) The concentration of a reaction
 - D) The molecularity of a reaction
209. Rate constant K_c
- A) Does not change with the increase of temperature
 - B) Change with the change of temperature
 - C) does not change with the decrease in temperature
 - D) None of these
210. Law of mass action states that rate of reaction is directly proportional to the
- A) Size of the container
 - B) Molar conc. of reactants
 - C) nature of reactants
 - D) All of the above
211. Liquid and its vapors acquire _____ at constant temperature
- A) Constant equilibrium
 - B) static equilibrium
 - C) dynamic equilibrium
 - D) none of these
212. If concentration of compound is taken in molar units then the equilibrium constant is
- A) K_i
 - B) K_{ip}
 - C) K_{ef}
 - D) K_i
213. Conventionally product concentration is taken in

- A) numerator
 - B) denominator
 - C) both of these
 - D) fractions
214. Which of the following has lowest heat of hydration?
- A) Li^+
 - B) Na^+
 - C) K^+
 - D) Mg^{2+}
215. How much energy is absorbed during dissolution of one mole of NaCl
- A) 2.008 KJ/mol
 - B) 1.008 KJ/mol
 - C) 4.008 KJ/mol
 - D) 3.008 KJ/mol
216. NaCl is used because of its ————— property in freezing the ice cream
- A) Constitutive property
 - B) Additive property
 - C) Colligative property
 - D) Raoult's law
217. ————— has the same oxidation number in all of its known compounds?
- A) Beryllium
 - B) Chlorine
 - C) Bromine
 - D) Nitrogen
218. In K_2MnO_4 , oxidation number of Mn is
- A) +7
 - B) +6
 - C) +5
 - D) +4
219. Which statement is correct about standard hydrogen electrode?
- A) 1.0M HCl solution is used
 - B) H_2 gas at 1 atm pressure is present
 - C) Platinum electrode is used
 - D) All of the above
220. Electrolysis is a process which utilizes
- A) Chemical energy

- B) Electrical energy
 - C) Heat energy
 - D) Biochemical energy
221. Standard hydrogen electrode has an arbitrarily fixed potential
- A) 0.00 volt
 - B) 1.00 volt
 - C) 0.10 volt
 - D) 2.00 volts
222. The oxidation number of chromium in $K_2Cr_2O_7$ is
- A) 14
 - B) 12
 - C) 6
 - D) 7
223. What is correct about electrolysis of molten NaCl
- A) Oxidation takes place at cathode
 - B) Cl_2 gas is produced at anode
 - C) Reduction occurs at anode
 - D) H_2 gas is produced at cathode
224. Oxidation state of oxygen in OF_2 is
- A) 0
 - B) +1
 - C) -2
 - D) +2
225. In superoxides, the oxygen has oxidation number
- A) 0
 - B) +1
 - C) -1/2
 - D) -1
226. An electrochemical cell which produces electricity with a redox reaction is called a
- A) Voltaic cell
 - B) Standard cell
 - C) Reversible cell
 - D) Electrolytic cell
227. A non-spontaneous redox reaction takes place as a result of electricity in
- A) Voltaic cell

- B) Denial cell
 C) Dry cell
 D) Electrolytic cell
228. Oxidation state of sulfur in SO_3^{2-} ?
 A) -4
 B) -2
 C) +2
 D) +4
229. In lead storage batteries the cathode is made of
 A) Pb
 B) Pb coated with PbO_2
 C) PbSO_4
 D) Mixture of Pb and PbO_2
230. Which reaction takes place at cathode during electrolysis?
 A) Oxidation
 B) Reduction
 C) Both
 D) None
231. In electrolysis of aqueous solution of NaCl which ion is discharged at anode
 A) Cl^-
 B) OH^-
 C) Na^+
 D) H^+
232. What is true of following for the given reaction?

$$\text{CrO}_7^{2-} + 14\text{H}^+ + 6\text{Cl}^- \rightarrow 2\text{Cr}^{3+} + 3\text{Cl}_2 + 7\text{H}_2\text{O}$$
 A) Chromium is oxidized
 B) Cl^- is reduced to Cl_2
 C) Cl^- is oxidized to Cl_2
 D) H^+ is reduced to H_2
233. On the basis of obtained standard deviation values, same set of samples analyzed with different methods can be compared using _____?
 A) Q test
 B) F test
 C) T test
 D) Regression coefficient
234. Detection limit is a concentration that gives a signal equals to _____ times to the standard deviation of the blank.

- A) 2
 - B) 4
 - C) 3
 - D) 5
235. An analytical method is classified as meso when concentration of the analyte is
- A) 10-100 mg
 - B) >100 mg
 - C) > 10 mg
 - D) 1-10 mg
236. How many significant figures are in answer of $47 - 47$.
- A) 1
 - B) 2
 - C) 5
 - D) 3
237. How many significant figures are in 0.00080670000.
- A) 8
 - B) 2
 - C) 5
 - D) 3
238. In atomic absorption spectrophotometer the flame used is
- A) air-coal gas
 - B) air-propane
 - C) air-acetylene
 - D) oxyacetylene
239. All are Argillaceous material irrespective of the
- A) Vlay
 - B) marine shells
 - C) Slate
 - D) blast furnace slag
240. Cement can be synthesized by
- A) dry process
 - B) wet process
 - C) both
 - D) None
241. Phosphorus is helpful in the growth of
- A) root

- B) Leave
 - C) stem
 - D) Seed
242. Rotary kiln comprises of zones
- A) 4
 - B) 3
 - C) 2
 - D) 5
243. Nutrients that are required in small amount for the growth of plants are
- A) nitrogenous fertilizers
 - B) Micronutrients
 - C) phosphorus fertilizer
 - D) all of the above
244. Urea can be most suitably synthesized by the raw material
- A) CH₄, N₂ and CO₂
 - B) H₂, N₂ and CO
 - C) H₂, CO₂ and H₂O
 - D) H₂O, N₂ and H₂
245. Urea is a fertilizer
- A) Synthetic
 - B) Natural fertilizer
 - C) provides micronutrients to the plants
 - D) inorganic water soluble compound
246. Percentage of nitrogen in urea is
- A) 36
 - B) 46
 - C) 56
 - D) (66
247. Both nitrogen and phosphorus can be provided by the fertilizer
- A) urea
 - B) calcium superphosphate
 - C) diammonium phosphate
 - D) potassium nitrate
248. Potassium functions in the plant to
- A) form starch sugar and fibrous material
 - B) ripen the seeds and fruits

- C) increase the resistance against disease
 - D) all the above statements are correct
249. Clinker is the
- A) roasted calcareous material
 - B) roasted argillaceous material
 - C) roasted calcareous and argillaceous material
 - D) roasted gypsum
250. Cement contains highest percentage of
- A) CaO
 - B) SiO₂
 - C) Al₂O₃
 - D) MgO
251. Raw material of cement does not contain
- A) lime stone
 - B) Gypsum
 - C) KNO₃
 - D) iron oxide
252. Manufacturing of cement process the correct sequence is
- A) crushing heating mixing grinding
 - B) crushing mixing heating grinding and mixing
 - C) crushing grinding mixing heating
 - D) mixing heating grinding crushing
253. Correct percentage of clay and lime stone for cement preparation is
- A) 75% lime stone and 25% clay
 - B) 25% lime stone and 75% clay
 - C) 15% lime stone and 55% clay
 - D) 55% lime stone and 15% clay
254. Pure water can be obtained from sea water through the process of
- A) centrifugation
 - B) separating funnel
 - C) fractional distillation
 - D) simple distillation
255. Bauxite is used as a raw material by the industry
- A) Aluminium Smelting
 - B) Steel
 - C) Jute

- D) Cement
256. Silica as a raw material is used by the industry
- A) Steel
 - B) Cement
 - C) Coal
 - D) Aluminium
257. Which gas is not water soluble
- A) ammonia
 - B) carbon dioxide
 - C) hydrogen
 - D) oxygen
258. Main source of thermal pollution is
- A) Sun heats up the lakes and ponds
 - B) Hot water from factories drains into rivers and ponds
 - C) Hot oil drains into rivers and lakes
 - D) None of these
259. The steel is marketed by public sector plants via
- A) TISCO
 - B) Tata Steel
 - C) SAIL
 - D) GAIL
260. For the treatment of industrial effluents, mechanical mean used is
- A) sedimentation
 - B) rainwater harvesting
 - C) recycling of waste water
 - D) biologically
261. The highest temperature of decomposition zone in cement manufacturing is
- A) 600°C
 - B) 800°C
 - C) 1000°C
 - D) 1200°C
262. Reedy plant from which the word paper is derived is
- A) Rose
 - B) Sun flower
 - C) Papyrus
 - D) Water Hyacinth

263. Borax in water is
- A) Soluble
 - B) Insoluble
 - C) Immiscible
 - D) Partially soluble
264. Which one of following is not the form of silica
- A) Smoky quartz
 - B) Amethyst quartz
 - C) Rose quartz
 - D) None
265. Which of following element is used in navigational equipment
- A) Be
 - B) Al
 - C) Mg
 - D) B
266. Find the successive elements of the periodic table with ionization energies, 2372, 520 and 890 kJ per mole, respectively
- A) Li, Be, B
 - B) H, He, Li
 - C) B, C, N
 - D) He, Li, Be
267. Which of the following statements is incorrect?
- A) I.E.1 of O is lower than that of N but I.E.2 O is higher than that of N
 - B) The enthalpy of N to gain an electron is almost zero but of P is 74.3 kJ mol⁻¹
 - C) Isoelectronic ions belong to the same period
 - D) The covalent radius of iodine is less than its Van der Waal's radius

268. Two different beakers contain M1-O-H, and M2-O-H solutions separately. Find the nature of the two solutions if the electronegativity of M1 = 3.4, M2 = 1.2, O = 3.5, H = 2.1

- A) acidic, acidic
- B) basic, acidic
- C) basic, basic
- D) acidic, basic

269. Which one will have the highest 2nd ionization energy?

- A) $1s^2 2s^2 2p^6 3s^1$
- B) $1s^2 2s^2 2p^4$
- C) $1s^2 2s^2 2p^6$
- D) $1s^2 2s^2 2p^6 3s^2$

270. One mole of ferrous oxalate requires _____ moles of MnO_4^- to get oxidized completely in an acidic medium

- A) 0.6 moles
- B) 0.4 moles
- C) 0.2 moles
- D) 7.5 moles

271. H_2SO_4 is it not acting as an oxidizing agent?

- A) $C + 2H_2SO_4 \rightarrow CO_2 + 2SO_2 + 2H_2O$
- B) $CaF_2 + 2H_2SO_4 \rightarrow CaSO_4 + 2HF$
- C) $S + 2H_2SO_4 \rightarrow 3SO_2 + H_2O$
- D) $Cu + 2H_2SO_4 \rightarrow CuSO_4 + SO_2 + 2H_2O$

272. In which of the following complex, the oxidation number of Fe is +1?

- A) $(Fe_4[Fe(CN)_6]_3)$
- B) $([Fe(H_2O)_5NO]SO_4)$
- C) $([FeBr_4]^-)$
- D) $[Fe(H_2O)_6]^{2+}$

273. How many orbitals can have the following set of quantum numbers, $n = 3, l = 1, m_l = 0$?
- A) 3
 - B) 1
 - C) 4
 - D) 2
274. Maximum number of electrons in a subshell can be
- A) $4l + 2$
 - B) $4l - 2$
 - C) $2n^2$
 - D) $2l + 1$
275. Which of the following is the atomic number of an element that forms basic oxide?
- A) 18
 - B) 17
 - C) 19
 - D) 15
276. A positive overlap mean
- A) Out-phase overlap
 - B) In-phase overlap
 - C) Zero overlap
 - D) None
277. Valence Bond Theory was developed in the year?
- A) 1916
 - B) 1927
 - C) 1930
 - D) 1932
278. According to VBT, the direction of a bond which is formed due to overlapping will be _____
- A) In the same direction in which orbitals are concentrated
 - B) In the opposite direction in which orbitals are concentrated
 - C) Perpendicular to the direction in which orbitals are concentrated
 - D) None of the mentioned
279. Which element would be the least electronegative element with
- A) high I.E. and low E.A.
 - B) low I.E. and high E.A.
 - C) low I.E. and low E.A.
 - D) high I.E. and low E.A.
280. The correct statement with respect to the complexes $\text{Ni}(\text{CO})_4$ and $[\text{Ni}(\text{CN})_4]^{2-}$ is

- A) nickel is in the same oxidation state in both
- B) both have tetrahedral geometry
- C) both have square planar geometry
- D) have tetrahedral and square planar geometry respectively

281. The IUPAC name of the complex $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$ is

- A) dichloro tetraammine cobalt (III) chloride
- B) tetraammine dichloro cobalt (III) chloride
- C) tetraammine dichloro cobalt (II) chloride
- D) tetraammine dichloro cobalt (IV) chloride

282. The number of unidentate ligands in the complex ion is called

- A) EAN
- B) Coordination number
- C) primary valency
- D) oxidation number

283. In coordination chemistry, the donor atom of a ligand is

- A) A Lewis acid.
- B) The counter ion
- C) The central metal atom.
- D) The atom in the ligand that shares an electron pair with the metal.

284. Which one of the following statements is FALSE about Crystal Field Theory?

- A) In an octahedral crystal field, the d electrons on a metal ion occupy the e_g set of orbitals before they occupy the t_{2g} set of orbitals.
- B) Diamagnetic metal ions cannot have an odd number of electrons.
- C) Low spin complexes can be paramagnetic.
- D) Low spin complexes contain strong field ligands.

285. According to, Crystal Field Theory strong field ligands such as CN^- :

- A) Usually produce high spin complexes and small crystal field splitting.
- B) Usually produce low spin complexes and small crystal field splitting.
- C) Usually produce low spin complexes and high crystal field splitting.
- D) Usually produce high spin complexes and high crystal field splitting.

286. According to Werner's theory

- A) Primary valency can be ionized
- B) Secondary valency can be ionized
- C) Both cannot be ionized
- D) Only primary cannot be ionized

287. Coordination number of Al is

- A) 8
- B) 6
- C) 12
- D) 4

288. The complex with of following ligand is
- A) Ammonia
 - B) Carbonyl
 - C) Ferrocyanide
 - D) Amine
289. A complex with a strong ligand is called
- A) High spin
 - B) Low pin
 - C) High energy
 - D) Stable
290. Which of following is an organometallic complex
- A) Lithium ethoxide
 - B) Ethyl lithium
 - C) Lithium acetate
 - D) Lithium carbide
291. The sum of coordination number and oxidation number of the metal M in the complex $[M(en)_2(C_2O_4)]Cl$ (where (en) is ethylenediamine) is
- A) 9
 - B) 6
 - C) 7
 - D) 8
292. An example of a sigma bonded organometallic compound is
- A) Grignard reagent
 - B) Ferrocene
 - C) Cobaltocene
 - D) Ruthenocene
293. Presence of which among the following minerals in Banana makes them slightly radioactive?
- A) Sodium
 - B) Calcium
 - C) Magnesium
 - D) Potassium
294. Which among the following methods can be used to remove the permanent hardness in water due to calcium or magnesium sulphates?
- A) Sulphonate method
 - B) Nitrate method
 - C) Zeolite method
 - D) None of these
295. Which of the following is not a non-metallic mineral?
- A) Mica
 - B) Bauxite
 - C) Granite
 - D) Silica

296. Which among the following is a common salt in Detergents?
- A) Sulphate
 - B) Nitrate
 - C) Sulphonate
 - D) Carbonate
297. The soul of chemistry is dealing with_____?
- A) Internal structural changes in matter
 - B) Composition of matter
 - C) Properties of matter
 - D) Composition and properties of matter
298. All of the following substances are crystalline except_____?
- A) Ice
 - B) Diamond
 - C) Sucrose
 - D) Plastic
299. Which one of the following has the maximum number of isotopes?
- A) Oxygen
 - B) Carbon
 - C) Tin
 - D) Chlorine
300. Photochemical smog normally does not contain
- A) Chlorofluorocarbons
 - B) Peroxyacetyl nitrate
 - C) Ozone
 - D) Acrolein
301. Find the incorrect statement
- A) BOD value of clean water is less than 5 ppm
 - B) Drinking water pH should be between 5.5-9.5
 - C) Carbon, sulphur and nitrogen oxides are the most widespread air pollutants
 - D) Dissolved oxygen concentration below 5 ppm is ideal for the growth of fish
302. Alum's capacity to purify water is due to
- A) Softens hard water
 - B) Pathogenic bacteria get destroyed
 - C) Impurities' coagulation

D) It improves taste

303. Which of the oxide of nitrogen is not a common pollutant?

A) N_2O_5

B) N_2O

C) NO

D) NO_2

304. In the air, N_2 and O_2 occur naturally but they do not react to form oxides of nitrogen because

A) Oxides of nitrogen are unstable

B) Catalyst is required for the reaction

C) The reaction is endothermic

D) N_2 and O_2 do not react with each other

305. Which one of the following is an example of adsorption?

A) Ammonia in contact with water

B) Anhydrous CaCl_2 with water

C) Silica gel in contact with water vapours

D) All of these

306. Which of the following colloids are solvent hating?

A) Lyophilic

B) Lyophobic

C) Hydrophilic

D) None of these

307. The process of separating a crystalloid, from a colloid by filtration is called

A) Emulsification

B) Dialysis

C) Coagulation

D) Peptization

308. Ibuprofen contains

A) Only S-enantiomer

B) Only R-enantiomer

C) The racemic mixture of both R and S enantiomer

D) Both R and S enantiomers are active pain killers

309. Nylon threads are made of

- A) Polyester polymer
- B) Polyamide polymer
- C) Polyethylene polymer
- D) Polyvinyl polymer

310. The polymer used in making hair synthetic hair wigs is made up of

- A) $\text{CH}_2=\text{CHCl}$
- B) $\text{CH}_2=\text{CHCOOCH}_3$
- C) $\text{C}_6\text{H}_5\text{CH}=\text{CH}_2$
- D) $\text{CH}_2=\text{CH}-\text{CH}=\text{CH}_2$

311. Important biological molecules functional groups contain

- A) Oxygen and/or nitrogen and are acidic
- B) Oxygen and a phosphate
- C) Nitrogen and a phosphate
- D) Oxygen and/or nitrogen and are polar

312. Natural buffers in living systems has acid/base pairs?

- A) $\text{H}_2\text{CO}_3/\text{HCO}_3^-$
- B) $\text{H}_2\text{PO}_4^-/\text{HPO}_4^{2-}$
- C) Histidine⁺/histidine
- D) All of these

313. Alanine, tyrosine, and lysine all are present in

- A) DNA
- B) Strong base
- C) Phospholipid
- D) Protein

314. Hydrophilic interactions and hydrogen bonds are types of

- A) Weak chemical bonds that hold together the atoms within a molecule
- B) Strong chemical bonds that hold together the atoms within a molecule
- C) Weak chemical bonds that link together separate molecules
- D) Strong chemical bonds that link together separate molecules

315. Fats accompany high energy than simple sugars due to presence of

- A) Carbon atoms
- B) hydrogen atoms
- C) Covalent bonds
- D) hydrogen bonds

316. Polar solvent has affinity to dissolve?

- A) Gasoline (heptanes & octanes)
- B) Methane
- C) Argon
- D) sodium chloride

317. Oxygen, Carbon and Nitrogen

- A) Can all form covalent bonds with other elements
- B) Contain protons and neutrons in their atomic nuclei
- C) Are common elements in the molecules that make up living organisms
- D) All of the above

318. Microtubules, actin filaments and motor proteins all are present in

- A) The mechanism of photosynthesis that occurs in chloroplasts
- B) The rough ER endoplasmic reticulum) in prokaryotic cells
- C) The cytoskeleton of eukaryotic cells
- D) the process that moves small molecules across cell membranes

319. _____ is a porous, double phospholipid bilayer structure

- A) the nuclear envelope
- B) the plasma membrane
- C) the mitochondrion

- D) the cytoskeleton
320. First line of defense for an organism against attack by an invader is usually
- A) To flee or hide
 - B) its body wall
 - C) a specific immune response
 - D) a nonspecific immune response
321. Fluid mosaic model of cell membranes proposes that
- A) the most common type of molecules in the membrane are proteins
 - B) Basic membrane structure results from how the proteins interact with water
 - C) The membrane is a highly mobile mixture of phospholipids and proteins
 - D) The unique properties of cell types are determined by their phospholipids
322. The peptide bond in proteins is
- A) Only found between proline residues
 - B) Usually cis unless proline is the next amino acid
 - C) Usually trans unless proline is the next amino acid
 - D) is planar because of steric hinderance
323. ΔH°_a for atomization of hydrogen is
- A) 199 kJ/mole
 - B) 218 kJ/mole
 - C) 250 kJ/mole
 - D) 299 kJ/mole
324. NaOH and HCl neutralization evolve heat
- A) -40.4kJ/mole
 - B) -50.5 kJ/mole
 - C) -55.5 kJ/mole
 - D) -57.4 kJ/mole
325. Standard enthalpy of combustion of ethanol is
- A) -100 kJ/mole
 - B) -1250 kJ/mole
 - C) -1368 kJ/mole
 - D) -1500 kJ/mole
326. Equilibrium can exist at the reaction completed
- A) 50%
 - B) < 50%
 - C) > 50%
 - D) any of above
327. Moles of a substance per litre is known as
- A) Molar concentration
 - B) active weight
 - C) composition
 - D) concentration
328. Rate of forward and backward reaction becomes equal at state
- A) Homogenous
 - B) equilibrium
 - C) heterogeneous
 - D) static
329. Products and reactants are present in sufficient amount in reaction mixture when K_c is
- A) Neither very large nor very small
 - B) very small
 - C) very large
 - D) infinity
330. Concentration is taken in
- A) mol. Ml
 - B) mol/liter
 - C) g equivalent liter

- D) g. Lit-1
331. When both forward and backward reaction proceeds at equal rate it is
A) State of equilibrium
B) dynamic equilibrium
C) chemical equilibrium
D) static equilibrium
332. An example of _____ equilibrium is when evaporation rate becomes equal to rate of condensation
A) Dynamic
B) chemical
C) static
D) physical
333. Dynamic equilibrium means the molar concentration of the reactants and products
A) Becomes constant
B) Becomes infinitely
C) Decreases
D) increases
334. According to law of mass action rate of reaction is proportional to the product of active masses of
A) Product
B) reactant
C) concentration
D) catalyst
335. When reactant and product are in same phase equilibrium is
A) Dynamic
B) heterogeneous
C) homogenous
D) static
336. Equilibrium involving different phases of reactants and products is
A) Dynamic
B) heterogeneous
C) homogenous
D) static
337. Multiple phases of reactant and products means a phase
A) Homogenous
B) heterogamous
C) dynamic
D) static
338. A heterogeneous equilibrium means reactant and products are in
A) Gaseous phase
B) liquid phase
C) solid phase
D) more than one phase
339. When a system loses some energy ΔE Carries a
A) Negative sign
B) Positive sign
C) Neutral sign
D) No sign
340. Along with the average energy of reactants additional energy required for successful reaction is called
A) Enthalpy function
B) Heat of reaction
C) effective energy
D) activation energy

341. A substance that alters the rate of reaction without itself being used is called
- A) Catalyst
 - B) electrolyte
 - C) acid
 - D) poison
342. A catalyst alters
- A) The direction of a reaction
 - B) The rate of a reaction
 - C) The concentration of a reaction
 - D) The molecularity of a reaction
343. Rate constant K_c
- A) Does not change with the increase of temperature
 - B) Change with the change of temperature
 - C) does not change with the decrease in temperature
 - D) None of these
344. Law of mass action states that rate of reaction is directly proportional to the
- A) Size of the container
 - B) Molar conc. of reactants
 - C) nature of reactants
 - D) All of the above
345. Liquid and its vapors acquire _____ at constant temperature
- A) Constant equilibrium
 - B) static equilibrium
 - C) dynamic equilibrium
 - D) none of these
346. If concentration of compound is taken in molar units then the equilibrium constant is
- A) K_i
 - B) K_{ip}
 - C) K_{ef}
 - D) K_i
347. Conventionally product concentration is taken in
- A) numerator
 - B) denominator
 - C) both of these
 - D) fractions
348. Which of the following has lowest heat of hydration?
- A) Li^+
 - B) Na^+
 - C) K^+
 - D) Mg^{2+}
349. How much energy is absorbed during dissolution of one mole of NaCl
- A) 2.008 KJ/mol
 - B) 1.008 KJ/mol
 - C) 4.008 KJ/mol
 - D) 3.008 KJ/mol
350. NaCl is used because of its _____ property in freezing the ice cream
- A) Constitutive property
 - B) Additive property
 - C) Colligative property
 - D) Raoult's law
351. _____ has the same oxidation number in all of its known compounds?
- A) Beryllium
 - B) Chlorine
 - C) Bromine
 - D) Nitrogen

352. In K_2MnO_4 , oxidation number of Mn is
A) +7
B) +6
C) +5
D) +4
353. Which statement is correct about standard hydrogen electrode?
A) 1.0M HCl solution is used
B) H_2 gas at 1 atm pressure is present
C) Platinum electrode is used
D) All of the above
354. Electrolysis is a process which utilizes
A) Chemical energy
B) Electrical energy
C) Heat energy
D) Biochemical energy
355. Standard hydrogen electrode has an arbitrarily fixed potential
A) 0.00 volt
B) 1.00 volt
C) 0.10 volt
D) 2.00 volts
356. The oxidation number of chromium in $\text{K}_2\text{Cr}_2\text{O}_7$ is
A) 14
B) 12
C) 6
D) 7
357. What is correct about electrolysis of molten NaCl
A) Oxidation takes place at cathode
B) Cl_2 gas is produced at anode
C) Reduction occurs at anode
D) H_2 gas is produced at cathode
358. Oxidation state of oxygen in OF_2 is
A) 0
B) +1
C) -2
D) +2
359. In superoxides, the oxygen has oxidation number
A) 0
B) +1
C) -1/2
D) -1
360. An electrochemical cell which produces electricity with a redox reaction is called a
A) Voltaic cell
B) Standard cell
C) Reversible cell
D) Electrolytic cell
361. A non-spontaneous redox reaction takes place as a result of electricity in
A) Voltaic cell
B) Denial cell
C) Dry cell
D) Electrolytic cell
362. Oxidation state of sulfur in SO_3^{2-} ?
A) -4
B) -2
C) +2

- D) +4
363. In lead storage batteries the cathode is made of
A) Pb
B) Pb coated with PbO₂
C) PbSO₄
D) Mixture of Pb and PbO₂
364. Which reaction takes place at cathode during electrolysis?
A) Oxidation
B) Reduction
C) Both
D) None
365. In electrolysis of aqueous solution of NaCl which ion is discharged at anode
A) Cl⁻
B) OH⁻
C) Na⁺
D) H⁺
366. What is true of following for the given reaction?
$$\text{CrO}_7^{2-} + 14\text{H}^+ + 6\text{Cl}^- \rightarrow 2\text{Cr}^{3+} + 3\text{Cl}_2 + 7\text{H}_2\text{O}$$

A) Chromium is oxidized
B) Cl⁻ is reduced to Cl₂
C) Cl⁻ is oxidized to Cl₂
D) H⁺ is reduced to H₂
367. based on obtained standard deviation values, same set of samples analyzed with different methods can be compared using —————?
A) Q test
B) F test
C) T test
D) Regression coefficient
368. Detection limit is a concentration that gives a signal equals to ————— times to the standard deviation of the blank.
A) 2
B) 4
C) 3
D) 5
369. An analytical method is classified as meso when concentration of the analyte is
A) 10-100 mg
B) >100 mg
C) > 10 mg
D) 1-10 mg
370. How many significant figures are in answer of 47 – 47. 213.
A) 1
B) 2
C) 5
D) 3
371. How many significant figures are in 0.00080670000.
A) 8
B) 2
C) 5
D) 3
372. In atomic absorption spectrophotometer the flame used is
A) air-coal gas
B) air-propane
C) air-acetylene
D) oxyacetylene

373. All are Argillaceous material irrespective of the
- A) Vlay
 - B) marine shells
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 - C) China
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 - B) Hot water from factories drains into rivers and ponds
 - C) Hot oil drains into rivers and lakes
 - D) None of these
394. steel is marketed by public sector plants via
- A) TISCO
 - B) Tata Steel

- C) SAIL
D) GAIL
395. For the treatment of industrial effluents, mechanical mean used is
A) sedimentation
B) rainwater harvesting
C) recycling of waste water
D) biologically
396. The highest temperature of decomposition zone in cement manufacturing is
A) 600°C
B) 800°C
C) 1000°C
D) 1200°C
397. Reedy plant from which the word paper is derived is
A) Rose
B) Sun flower
C) Papyrus
D) Water Hyacinth
398. $n \rightarrow \sigma^*$ transition can happen in
A) Saturated Alkyl halides
B) Alcohols
C) Aldehydes
D) All of these
399. In flame photometry, the temperature of flame is determined depending upon
A) Excitation energy of the element
B) How it is combined in the sample
C) The sensitivity required
D) Presence of other elements
400. Which of the following processes may occur in flame?
A) translational, vibrational and rotational motions
B) excitation
C) ionization
D) All
401. Which of the following are involved in electronic transitions in organic molecules?
A) σ – electrons
B) n – electrons
C) π – electrons
D) All
402. Which of the following are separated with perfusion chromatography?
A) Polar compounds
B) Macromolecules
C) Micro molecules
D) Non polar compounds
403. Which of the following chromatographic techniques sometimes uses detector based on radio activity?
A) GC
B) SEC
C) TLC
D) HPLC
404. In HPLC silica gel is used in the form of
A) Aquagel
B) Xerogel
C) Hydrogel
D) Biogel

405. Which of the following adsorbents is used for separation of xanthophyll and carotenoids?
A) Silica gel
B) Alumina
C) Starch
D) Calcium carbonate
406. Example of the micro wave active molecule is
A) HCl
B) CO
C) CHCl₃
D) CH₃Cl
407. Which of the following when attached with benzene ring produces auxochromic effect?
A) – CH₃
B) – Cl
C) – Br
D) All
408. Which device is used to prevent the back flow during pumping in chromatography?
A) Check valve
B) Pressure
C) Diffusion
D) Gas flow
409. Two partially immiscible liquids form a single phase at a temperature which is known as
A) Transition temperature
B) Absolute temperature
C) Consulate temperature
D) Room temperature
410. At what conditions the molar volume of CO₂ is maximum?
A) STP
B) 127°C & 1 atm
C) 0°C and 1 atm
D) 273°C and 1atm
411. All gases liquefy before reaching at
A) 373 K
B) 273 K
C) -473 K
D) 0 K
412. Select the correct relationship
A) 1mm Hg = 1 torr = 1 atm
B) 1mm Hg = 760 torr = 1 atm
C) 760 mm Hg = 760 torr = 1 atm
D) 760 mm Hg = 1 torr = 1atm
413. Acetone and chloroform mix with each other because of
A) Intermolecular hydrogen bonding
B) Dipole-dipole interaction
C) Instantaneous dipole
D) All of the above
414. Which of the following solid substances is considered as pseudo solid?
A) NaCl
B) Glass
C) CaF₂
D) All

415. Antifreeze in the automobile is an important application of
A) Constitutive property
B) Additive property
C) Colligative property
D) Chemicals
416. What is the order of reaction of photosynthesis?
A) 0
B) 1
C) 2
D) Fractional order
417. What information is obtained from collision theory?
A) Rate of reaction
B) order of reaction
C) Molecularity of reaction
D) All of these
418. The reaction of hydrolysis of ethyl-acetate ester) is a
A) 1st order
B) 2nd order
C) 3rd order
D) 0 order
419. If the rate constant k is in $\text{mol}^{-1} \text{dm}^3 \text{s}^{-1}$, the order of reaction will be
A) 1
B) 2
C) 3
D) 0
420. Mn^{2+} ions formed during oxidation with KMnO_4 and acid which act as catalyst. This is an example of
A) Chemo-catalyst
B) Auto-catalysis
C) Inhibitor
D) Poisoning of catalysts
421. Instantaneous rate of reaction at the beginning is always _____ than average rate
A) Small
B) Smaller
C) Higher
D) Medium
422. What is the order of a reaction with $\text{Rate} = K [\text{N}_2\text{O}_5]$?
A) First order
B) Pseudo first order
C) Second order
D) Third order
423. Main component of solution is
A) Solvent
B) Solute
C) Solvent as well as solute
D) Solid particles
424. At given temperature if maximum amount of solute is present in a solvent, it gives
A) Saturated solution
B) Unsaturated solution
C) Supersaturated solution
D) Impure solution
425. Percentage composition may have possible relations
A) Four
B) Five
C) Three

- D) One
426. The oxidation number in elemental states is always
A) Positive
B) Negative
C) Zero
D) Non-zero
427. K^+ has oxidation number
A) +1
B) +2
C) +3
D) -2
428. Ca^{2+} shows oxidation number
A) +1
B) +2
C) +3
D) -2
429. Except metal Hydrides, hydrogen shows oxidation state
A) 0
B) +1
C) -1
D) -2
430. In metal hydrides, oxidation state of hydrogen is
A) 0
B) +1
C) -1
D) $\frac{1}{2}$
431. Oxygen except peroxides and super oxides shows oxidation state of
A) -1
B) -2
C) +2
D) $-\frac{1}{2}$
432. In peroxides oxygen shows oxidation number
A) -1
B) -2
C) +2
D) $-\frac{1}{2}$
433. Oxidation state of oxygen in super oxides is
A) -1
B) -2
C) +2
D) $-\frac{1}{2}$
434. The oxidation number of oxygen in OF_2
A) -1
B) -2
C) +2
D) $-\frac{1}{2}$
435. The oxidation number of each element of group VII-A in binary compounds is
A) -1
B) -2
C) +2
D) 0
436. Group IA elements shows oxidation state
A) -1
B) -2

- C) +1
D) +2
437. Group IIA elements shows oxidation state of
A) -1
B) -2
C) +2
D) +4
438. Group IIIA elements shows oxidation state of
A) -1
B) -2
C) +2
D) +4
439. In a neutral compound total sum of all the oxidation states is always
A) Zero
B) One
C) Two
D) Three
440. Chromium shows oxidation number in sodium dichromate
A) +4
B) +6
C) +5
D) +8
441. Noble gases show oxidation number
A) +1
B) 0
C) -1
D) -2
442. Chromium has oxidation number in $K_2Cr_2O_7$
A) +4
B) +6
C) +5
D) +8
443. Sulphur in SO_2 has oxidation number
A) -4
B) +6
C) +4
D) +2
444. Iron in $K_3Fe(CN)_6$ shows oxidation state
A) +2
B) +3
C) +4
D) +1
445. 12% alcohol means 12cm^3 of alcohol dissolved in _____ of solution
A) 90cm^3
B) 100cm^3
C) 110cm^3
D) 112cm^3
446. If a solution is 10^{-7}M , it would be
A) Neutral solution
B) Acidic solution
C) Basic solution
D) slightly acidic
447. 1 litre of solution having one mole of solute is
A) 1 molar

- B) 1molal
 C) 1 Normal
 D) None of the above
448. CaCO_3 has the percentage composition
 A) Ca 1%, C 1%, O₂ 3%
 B) Ca 40%, C 12%, O₂ 48%
 C) Ca 12%, C 40%, O₂ 48%
 D) Ca 48%, C 12%, O₂ 40%
449. A solution having hydrogen ion concentration of 5.5×10^{-3} M will have the pH
 A) 2.26
 B) 3.40
 C) 3.75
 D) 2.76
450. Technique that can be used to separate aniline from a mixture is
 A) Fractional crystallization
 B) Fractional distillation
 C) Vacuum distillation
 D) Steam distillation
451. Which units of solution are independent of temperature
 A) Molarity
 B) Normality
 C) Formality
 D) Molality
452. If a solution is made by mixing 20 ml of N/2 H_2SO_4 , 5ml of N-HCl, and 30ml of N/3 HNO_3 in one litre, resulting normality will be
 A) N/5
 B) N/10
 C) N/20
 D) N/40
453. In NH_4OH silver halide that is least soluble
 A) AgBr
 B) AgF
 C) AgCl
 D) AgI
454. A salt gives yellow precipitates by passing H_2S gas through its acidified solution that is soluble in ammonium sulphide, the radical present is
 A) As^{3+}
 B) Sb^{3+}
 C) Cd^{2+}
 D) Cu^{2+}
455. In qualitative analysis of Fe, during precipitation NH_4Cl is added before NH_4OH to
 A) Decrease concentration of OH^- ions
 B) Prevent interference by phosphate ions
 C) Increase concentration of Cl^- ions
 D) Increase concentration of NH_4^+ ions
456. When HCl is added to stannous sulphide solution made with yellow ammonium sulphide, the precipitates formed are
 A) SnS
 B) SnS_2
 C) Sn_2S_2
 D) $(\text{NH}_4)_2 \text{SnS}_2$
457. Which one of the following can be used instead of NH_4Cl for the precipitation of the third group radicals
 A) Ammonium nitrate
 B) Ammonium sulphate

- C) Ammonium oxalate
D) Sodium chloride
458. Before the analysis of III group radicals the conc. Nitric acid is added to
A) Oxidise any remaining H_2S
B) Form nitrate which gives granular ppt.
C) Convert ferrous into ferric ions
D) Increase ionization of $NH_4 OH$
459. When KI is heated by mixing with conc. $H_2 SO_4$, specie formed is
A) HI
B) I_2
C) HIO_3
D) KIO_3
460. IVth group of basic radicals is analyzed in the presence of H_2S by adding
A) HCl
B) NaOH
C) NH_4Cl
D) NH_4Cl and NH_4OH
461. If flame test of a salt generates brick red color, it indicates
A) Na
B) K
C) Sr
D) Ca
462. C_5H_{12} generates 1 signal in the proton NMR while 2 signals are generated in C-13 NMR, compound is
A) pentane.
B) 2-methylbutane.
C) 2,2-dimethylpropane.
D) Cannot tell without more information.
463. How many ml of 1M H_2SO_4 solution can be neutralize by using 10 milliliters of 1M NaOH solution?
A) 2.5 ml
B) 5.0 ml
C) 10 ml
D) 20 ml
464. 464 Molal solution means one mole of solute dissolved in
A) 1000 gm of the solvent
B) One litre of the solvent
C) One litre of the solution
D) 22.4 litre of the solution
465. 0.1 M solution is basic by
A) Ammonium acetate
B) Ammonium chloride
C) Ammonium sulphate
D) Sodium acetate
466. Heat changes in a chemical are studied in the branch of chemistry is
A) Thermochemistry
B) Electrochemistry
C) Photochemistry
D) Thermodynamics
467. In Joules calorie is equivalent
A) 0.418 J
B) 41.84 J
C) 4.184 J
D) 418.45 J

468. Energy of a state function is
A) Highest
B) Lowest
C) Intermediate
D) Have any amount of energy
469. System always tends to be stable by attaining a state of
A) Lowest energy
B) Same as before
C) Higher energy
D) Reverse to original energy
470. If heat is transferred from the system to the surrounding process is called
A) Endothermic
B) Exothermic
C) Fast reaction
D) Emitter
471. Heat is released in reaction is
A) Exothermic
B) Endothermic
C) None of these
D) Both of these
472. If heat change is negative, reaction is said to be
A) Reversible
B) At equilibrium
C) Exothermic
D) Endothermic
473. AgCl in water has the solubility product
A) 1.8×10^{-10}
B) 9.8×10^{-6}
C) 1.2×10^{-10}
D) None of the above
474. To make Saturated solution of NaCl in water at 0°C we needs
A) 37.5 g of NaCl in 100g of H_2O
B) 37.5 g of NaCl in 1000 g of H_2O
C) 375 g of NaCl in 100 g of H_2O
D) 37.5 g of NaCl in 10 g of H_2O
475. The solubility of $\text{Ce}_2\text{SO}_4)_3$ shows straight line in graph
A) Below 40°C
B) Below 30°C
C) from 40°C onwards
D) From 60°C onwards
476. CuSO_4 in water at 0°C shows the solubility of
A) 14.3 g/100g
B) 14.3 g/10g
C) 39.0g/100g
D) 48.2g/100g
477. At 100°C CuSO_4 in water shows solubility of
A) 60.5g/100g
B) 65.5 g/100g
C) 75.5 g/100g
D) 80.9g/100g
478. Not a colligative property?
A) Density
B) depression of freezing pint
C) Elevation of boiling point

- D) Osmotic pressure
479. Hydrates are obtained by crystallizing compounds from there
- Aqueous solution
 - original solution
 - saturated solution
 - Dilute solution
480. Heat is evolved in which of the following process most likely?
- Dissociation
 - Sublimation
 - Hydration
 - Ionization
481. Molal boiling point constant K_b is the ratio of the elevation in boiling point to
- Molarity
 - Molality
 - Mole fraction of solvent
 - mole fraction of solute
482. The average rate of reaction between two intervals is to reaction rate at any moment
- Equal
 - Not equal
 - Balanced
 - Higher
483. Mathematically rate of reaction is
- dc/dt
 - dt/dc
 - $d \ C)Dt$
 - $d \ C)^2/dt)^2$
484. By increasing the concentration of reactants
- Increases the number of collisions directly
 - Has no effect on the number of collisions
 - Has inverse effect on the number of collisions
 - Decrease the number of collisions
485. For a reaction, $A \rightarrow B$, Rate of reaction = $-dx/dt$ means the concentration of the reacting specie
- Increasing
 - decreasing
 - Not changing
 - Reaction is not possible
486. Units for Concentration of a solution are
- Mol/litre
 - $\text{mol}^{-1}/\text{litre}^{-1}$
 - mol^{-1}
 - mol l
487. The rate of reaction has units
- $\text{Mol l}^{-1}\text{s}^{-1}$
 - $\text{Mol}^{-1}\text{l}^{-1}\text{s}^{-1}$
 - Mol l S^{-1}
 - Mol l s
488. If concentration change for a reaction is zero, the rate of reaction will be
- 1
 - 0
 - depends on time
 - Impossible to predict
489. By increase the initial concentration of reactant reaction rate may
- Increase

- B) Decrease
 C) Does not effect at all
 D) All above
490. In reaction $2\text{H}_2+2\text{NO} \rightarrow 2\text{H}_2\text{O}+\text{N}_2$ doubling or tripling the concentration of NO, rate increases
 A) Four times & nine times
 B) Five times & ten times
 C) Three times & six times
 D) Two times & three times
491. Temperature increase causer the increase in the reaction rate of
 A) Exothermic reaction
 B) Endothermic reaction
 C) Increase a little
 D) Decrease rapidly
492. Increase in temperature causes the rate of reaction to
 A) Increase greatly
 B) Does not increase
 C) Increase a little
 D) decrease rapidly
493. Correct units of reaction rate are?
 A) mol/dm^3
 B) Mol/s
 C) $\text{Mol}/\text{dm}^3\text{s}$
 D) S
494. By increasing concentration, the rate of reaction
 A) Increases
 B) Decreases
 C) Remains same
 D) Not effected at all
495. Units for the rate of gaseous reaction are expressed as
 A) Grams/s
 B) Atomic s^{-1}
 C) $\text{Mol l}^{-1} \text{s}^{-1}$
 D) Atmospheric sec^{-1}
496. Reaction rate
 A) Increases as reaction proceeds
 B) Decreases as reaction proceeds
 C) Remains the same as reaction proceeds
 D) May decreases or increases
497. A 10°C increase in temperatures doubles the rate of reaction due to
 A) Decreases activation energy of reaction
 B) Decrease the number of collisions between reactions
 C) Increase in the activation energy of reactants
 D) Increase in the number of effective collisions
498. Nuclear spin can be observed
 A) in all Nuclei
 B) in most Nuclei
 C) only in g,g Nuclei
 D) in C nuclei only
499. When subjected to a strong magnetic field
 A) one measures an IR spectrum
 B) the swaying of an atom becomes larger
 C) the nuclear spins orient themselves
 D) C atoms orient only

500. A solute of red color will
A) absorbs red light
B) absorbs green light
C) emits green light
D) Absorb orange light
501. Extinction coefficient is
A) a constant of a substance
B) a universal constant
C) equal to one
D) equal to 0
502. If concentration of substance is doubled
A) the wave length of the absorption is different
B) the extinction coefficient is twice as large
C) the extinction is twice as large
D) 4 times large
503. Infrared radiations are
A) waves of warmth
B) possessing more energy than UV waves
C) red
D) Cool waves
504. In IR spectrum, the units of entity taken on the abscissa are
A) meter
B) centimeter
C) per centimeter
D) per meter
505. Aqua-regia is formed by mixing
A) 1part conc. HCl and 3 parts conc. HNO₃
B) 2part conc. HCl and 1 part conc. HNO₃
C) 2parts conc. HCl and 1 part conc. HNO₃
D) 3parts conc. HCl and 2 parts conc. HNO₂
506. Why HCl is preferred over HNO₃ to make solutions in inorganic salt analysis?
A) Nitrates are not decomposed to sulphides
B) Nitric acid contains nitrogen
C) Hydrochloric acid is not an oxidizing agent
D) Chlorides are easily converted to sulphides
507. The units taken on abscissa in an NMR spectrum are
A) δ
B) Hertz
C) ppm
D) nm
508. Largest chemical shift signal appeared in a ¹³C NMR spectrum is due to
A) C=O groups
B) CH₃ groups
C) aromatic C-Nuclei
D) All have same value
509. In NMR spectrum, a triplet means
A) a triple linear signals
B) three signals
C) three spectrums
D) Due to doublet in vicinity
510. In a ¹H NMR at a neighboring C atom a CH₂ group generates
A) doublet
B) triplet
C) quadruplet
D) pentate

511. In aromatic C nucleus, a hydrogen signal is expected at
A) 2 ppm
B) 4 ppm
C) 7 ppm
D) 9 ppm
512. ^{13}C NMR spectrum
A) a triplet is evidence of a CH_3 group presence
B) the signals are between 0 and 10 ppm
C) every C atom generates a signal
D) every H atom generates a signal
513. In mass spectrometry
A) the analyzed substance remains intact
B) large quantities of the substance are required
C) the analyzed substance is ionized
D) All
514. In qualitative analysis Al^{3+} , Cr^{3+} and Fe^{3+} are kept in same group because their
A) Carbonates are insoluble in ammonia
B) Hydroxides are insoluble in ammonia
C) Sulphides are soluble in acids
D) Electronic charge is the same
515. Mass spectrometry provides the information about
A) the color of a substance
B) the molecular mass of a substance
C) the reactivity of a substance
D) Physical properties
516. Function of magnet in mass spectrometer is to work as
A) recorder for the NMR spectrum
B) accelerator for the ions
C) deflector for the ions
D) protector for the ions
517. Approximate weight of an element having specific heat 0.16, will be
A) 16
B) 40
C) 30
D) 64
518. Most deshielded protons are present in
A) CH_3Cl
B) CH_3I
C) CH_3Br
D) CH_4
519. Most deshielded methyl protons are present in
A) tetramethylsilane
B) methyl fluoride
C) methanol
D) methylamine
520. Splitting pattern of methylene protons in propane is
A) triplet
B) quartet
C) doublet
D) septet
521. Methylene protons shows signal for of butane
A) doublet
B) triplet
C) quartet
D) quintet

522. Amount of O_2 liberated when 10 ml 20 vol solution of H_2O_2 is heated
- A) 20 ml
 - B) 30 ml
 - C) 200 ml
 - D) 400 ml
523. At upper consolute temperature of $49.1^\circ C$ Methanol cyclohexane system show percentage
- A) 21%
 - B) 23%
 - C) 27%
 - D) 29%
524. Phenol water system homogenizes as
- A) 30% Phenol, 70% water
 - B) 35% phenol, 65% water
 - C) 34% phenol, 66 % H_2O
 - D) 40% Phenol, 60 % H_2O
525. Single layer of water aniline system appears at
- A) $120^\circ C$
 - B) $134^\circ C$
 - C) $165^\circ C$
 - D) $167^\circ C$
526. Consolute temperature of Methanol cyclohexane system is
- A) $35.1^\circ C$
 - B) $41.3^\circ C$
 - C) $49.1^\circ C$
 - D) $51.4^\circ C$
527. Raoult's law depicts that the lowering of V.P is
- A) Inversely proportional to mole fraction of solute
 - B) Directly proportional to mole fraction of solute
 - C) Inversely proportional to absolute T
 - D) Directly proportional to absolute T
528. Relative lowering of vapor pressure is
- A) Independent of T
 - B) depends upon the concentration of solute
 - C) Is constant when equimolar proportion of different solutes are dissolved in the same mass
 - D) all of the above
529. Substance having chemically attached water molecules is called
- A) Crystal
 - B) Hydrate
 - C) Solvate
 - D) None of these
530. If CH_3COONa is hydrolyzed the solution produced will be
- A) Acidic
 - B) Basic
 - C) neutral
 - D) None of these
531. At a given temperature the amount of solute dissolved in 100 g of solvent is known as
- A) Solubility Product
 - B) Solubility
 - C) Molarity
 - D) Normality
532. If Cl^- ions are added to saturated solution of KCl , solubility of KCl will
- A) Decrease
 - B) Increases

- C) Remains the same
D) Not effect at all
533. The substance that does not dissolve in sufficient amount is known as
A) Sparingly soluble
B) Miscible
C) Remains same
D) Not effect at all
534. At freezing point temperature, solid and liquid phases of given substance have the
A) different vapor pressure
B) Same vapor pressure
C) Absolute vapor P
D) none of these
535. Elevation of boiling point of a substance
A) Can be studied by Beckmann method
B) Can be studied by Landberger,s method
C) cannot be studied by Landbergers method
D) None of these
536. Following is the colligative property
A) lowering of vapor pressure
B) elevation of boiling point
C) Depression of freezing point
D) All of the above
537. Colligative properties are dependent on
A) The number of solute ions
B) The number of solvent ions
C) Both A & B
D) Might A not B
538. When the solvent is containing dissolved nonvolatile solute particles is
A) Vapor pressure is decreased
B) Vapor pressure is elevated
C) vapor pressure is neither decreased nor increased
D) Vapor pressure is either decrees or increase
539. Greater the concentration of solute
A) The higher will be boiling point
B) The lower will be boiling point
C) The boiling point is not affected
D) no change in vapor pressure
540. There is 1g CO_3^{-1} present in 1000g aq solution of CaCO_3 . The concentration of solution is
A) 1000 ppm
B) 100 ppm
C) 10 ppm
D) 10, 000 ppm
541. For the preparation of 250Cm^3 of 0.1M solution how much NaOH is required?
A) 1g
B) 10 g
C) 2g
D) 6g
542. 2% NaOH solution has molality nearly
A) 0.5
B) 0.05
C) 0.25
D) 2.05
543. In a 500cm^3 of 3M solution the number of moles of solute are
A) 1

- B) 1.5
C) 3
D) 4
544. If 8g of NaOH dissolved in 500 cm³ of solution the molarity will be?
A) 0.2M
B) 0.04M
C) 0.4M
D) 0.8M
545. Molarity of a solution has units
A) moles/Kg
B) g/dm³
C) dm³/mol
D) Mol/dm³
546. The mole fraction is expressed in units
A) mol/dm³
B) Moles/kg
C) g/dm³
D) None
547. Mole fraction of oxygen in 7g nitrogen and 8g oxygen mixture is
A) 1
B) 0.1
C) 0.5
D) 0.2
548. Electrolysis of KNO₃(aq) generates
A) K and N
B) K and N₂
C) N₂ and O₂
D) K and O
549. NaOH electrolysis gives
A) H is collected at anode
B) is collected at anode
C) H₂ at anode
D) O₂ at anode
550. In down cell product is obtained by electrolysis of
A) Aqueous solution of NaCl
B) Fused sodium chloride
C) Aqueous solution & fused NaCl at some time
D) D) Either A) or B)
551. Caustic soda is prepared industrially from
A) Concentrated solution of NaCl
B) Any solution of NaCl
C) Dilute solution of NaCl
D) Fused NaCl
552. Magnesium metal is obtained in electrolytic cell by
A) Concentrated aqueous solution of its chloride
B) Dilute aqueous solution of its chloride
C) Its fused chloride
D) Any solution
553. Aluminum is obtained in electrolysis process from
A) Fused Bauxite
B) In the presence of catalyst
C) In the presence of fused cryolite
D) All of the above
554. Cell that produces electricity is called
A) Dry cell

- B) Unit cell
C) Voltaic cell
D) Battery cell
555. Cathode attracts
A) Cations
B) Anions
C) Hydroxyl ions
D) Oxide ions
556. Anode attracts
A) Anions
B) Cations
C) Electrodes
D) Neutral in nature
557. Reducing agent is itself
A) Oxidized
B) Ionized
C) Reduced
D) Neutralized
558. Addition of oxygen or removal of hydrogen is called
A) Oxidation reaction
B) Reduction reaction
C) Half cell reaction
D) Over cell reaction
559. Oxidation takes place at
A) Anode
B) Cathode
C) Electrode
D) Ion solution
560. Electrons are received at
A) Anode
B) Cathode
C) Electrode
D) wall of cell
561. Electrons are lost in
A) Oxidation
B) Reduction
C) Electrolysis
D) Valiancy
562. $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$ here calcium under goes.
A) Oxidation
B) Reduction
C) No change in oxidation state
D) Both oxidation and Reduction
563. Emf generated by voltaic cell is called
A) Oxidation potential
B) Cell potential
C) Redox potential
D) None of above
564. Electromotive force is measured in
A) Volts
B) Joule
C) Coulomb
D) Ohm
565. Electrolyte can conduct electricity
A) In the form of solution

- B) In fused state
 C) In any form
 D) D) Either A) or B)
566. SHE arbitrarily taken as
 A) 0.0 volt
 B) 1.0 volt
 C) 0.10 volt
 D) 1.20 volt
567. Metal can replace other in a reaction if it has place in series
 A) Below
 B) Above
 C) Between
 D) Anywhere in
568. Lead accumulator battery has cathode made of
 A) Pb
 B) PbO₂
 C) PbO₃
 D) CuO
569. The single cell of lead accumulator generates
 A) 2 V
 B) 2.5 V
 C) 4 V
 D) 8 V
570. Alkaline battery cell generates
 A) 1 volt
 B) 1.5 volt
 C) 2 volt
 D) 5 volt
571. Solute particles are surrounded by solvent molecules in
 A) Hydrolysis
 B) Hydration
 C) Solvation
 D) Dissolution
572. Solution having higher amount of salt dissolved is
 A) Saturated solution
 B) Buffer solution
 C) Concentrated solution
 D) Unsaturated solution
573. The enthalpy change for the reaction of an acid and base is called
 $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
 A) Heat of reaction
 B) Heat of formation
 C) Heat of neutralization
 D) Heat of combustion
574. In a spontaneously endothermic reaction the temperature of the surrounding
 A) Remains constant
 B) Increases
 C) Decreases
 D) Remain unchanged
575. The enthalpy of any element in its standard state is
 A) 1 kJ mol⁻¹
 B) Zero
 C) 298 kJ mol⁻¹
 D) Always +ve

576. The unit of enthalpy is
A) Joule
B) Coulomb
C) Volt
D) $\text{Kg m}^{-1} \text{s}^{-1}$
577. Total kinetic energy of molecules is due to sum of its
A) Translational motion
B) Rotational motion
C) Vibrational motion
D) All
578. Which property of gas is state function?
A) Enthalpy
B) Entropy
C) Pressure
D) All of these
579. Which of the following is and endothermic process?
A) Condensation of steam
B) Freezing of water
C) Electrolysis of water
D) All
580. In a bomb calorimeter the reaction is carried out at _____
A) Constant volume
B) Constant pressure
C) Constant pressure
D) a, b and c condition
581. Solubility of CaOH_2 is exothermic and will increase
A) At high temperature
B) At low temperature
C) Temperature independent
D) None
582. Ionization constant K_a for acetic acid at 25°C is
A) 1.85×10^{-5}
B) 1.85×10^{-10}
C) 1.85×10^{-15}
D) 1.85×10^{-20}
583. The rate of reaction _____ as reaction proceeds.
A) Increases
B) Decreases
C) Remains same
D) May decrease or increase
584. What is the pH of pure water?
A) 6.2
B) 7
C) 14
D) 0
585. Human blood has a pH value of
A) 7.0
B) 7.35
C) 7.85
D) 6.65
586. 0.001N NaOH aqueous solution has pH
A) 11
B) 3
C) 8
D) 12

587. The dissociation constant for water at 25°C is
A) 1×10^{-7}
B) 1×10^{-14}
C) 1×10^{-19}
D) 7×10^{-14}
588. If H^+ ions concentration is 1×10^{-7} its pH will be
A) Acid
B) Basic
C) Neutral
D) Zero
589. Crystalline solids containing water are called
A) Hydrates
B) Hydrides
C) Hydrolyzed
D) All above
590. Azeotropic mixtures can be separated by
A) Simple distillation
B) Fractional distillation
C) Vacuum distillation
D) All
591. The molality of solution containing 10g of NaOH/Kg solution is
A) 0.25m
B) 0.5m
C) 1.0m
D) 2.0m
592. Hydrolysis of potassium acetate produces
A) Acidic solution
B) Basic solution
C) Neutral solution
D) None of these
593. One molal solution contains
A) 1 dm^3 of solvent
B) 1 dm^3 of solution
C) 1000 g of solvent
D) 22.4 dm^3 of solution
594. In a solution the sum of mole of fractions of all components is always equal to
A) Zero
B) One
C) Two
D) 100
595. Two miscible liquids obey Raoult's law if
A) $\Delta H = 0$
B) $\Delta V = 0$
C) Both ΔH and ΔV are zero
D) Neither ΔV nor ΔH should be zero
596. Which of the following compounds has highest freezing point?
A) 1 mole NaCl
B) 1 mole KCl
C) 1 mole CaCl_2
D) 1 mole Urea
597. 10% aqueous solution of glucose freezes at
A) 0°C
B) $< 0^\circ\text{C}$
C) $> 0^\circ\text{C}$

- D) Suspension
598. Paschen, Bracket and P-fund series of emission spectra of atomic hydrogen lie in
- A) Infrared region
 - B) X-ray region
 - C) Ultraviolet region
 - D) Microwave region
599. According to Aufbau's principle which one of the following orbitals should be filled first?
- A) 3d
 - B) 4f
 - C) 5d
 - D) 4s
600. X-rays are attracted towards
- A) Anode
 - B) Cathode
 - C) Both (a & b)
 - D) All
601. Which of the following rays are used in television picture tube?
- A) Positive rays tube
 - B) Discharge tube
 - C) X-rays tube
 - D) Millikan tube
602. Which of the following quantum numbers determines the shape of an orbital?
- A) Spin
 - B) Azimuthal
 - C) Magnetic
 - D) Principal
603. Which of the following atomic orbitals has highest energy?
- A) 2s
 - B) 1s
 - C) 3s
 - D) 4d
604. Which quantum number will be different for the two electrons present in an s-orbital?
- A) Principle quantum number
 - B) Azimuthal quantum number
 - C) Magnetic quantum number
 - D) Spin quantum number
605. In nitrogen with electronic configuration $1s^2, 2s^2, 2p^3$ the number of unpaired electrons is
- A) 0
 - B) 1
 - C) 3
 - D) 5
606. Principle, azimuthal and magnetic quantum numbers are respectively related to
- A) Size, shape and orientation
 - B) Shape, orientation and size
 - C) Size, orientation and shape
 - D) Shape, size and orientation
607. Dalton's law of partial pressure is not obeyed by
- A) N_2 and O_2
 - B) H_2 and O_2
 - C) NH_3 and HCl
 - D) H_2 and He
608. In comparison to H_2 the diffusion rate of a gas having 72 molar mass will be
- A) 1/6 times

- B) 1.4 times
C) 6 times
D) same
609. If a gas at 273 K and 76 cm Hg has a density of 1.98 g dm^{-3} it could be
A) CH_4
B) C_2H_6
C) CO_2
D) Xe
610. Liquefaction of an ideal gas is not possible because
A) It has critical temperature above 0°C
B) Molecules have small size
C) Molecules have extra-large size
D) Negligible operative force
611. Density of a gas is usually expressed in
A) Kg m^{-3}
B) Kg dm^{-3}
C) g dm^{-3}
D) g cm^{-3}
612. The SI units for Van der Waal constant "a" is
A) $\text{atom dm}^3\text{mol}^{-2}$
B) $\text{atom dm}^6\text{mol}^{-2}$
C) $\text{Nm}^4 \text{mol}^{-2}$
D) Nm mol^{-1}
613. The Chromatography in which the mobile phase is a gas is called?
A) Absorption
B) Partition
C) Gas
D) Ion exchange
614. In paper chromatography if the paper is dipped in a pool at the bottom of the container it is called?
A) Liquid solid chromatography
B) Liquid gas chromatography
C) Descending paper chromatography
D) Ascending paper chromatography
615. In paper chromatography retardation factor (Rf) value cannot be more than
A) 0
B) 0.1
C) 1
D) 0.5
616. Gas chromatography can only be used for mixtures which are
A) Volatile or thermally unstable
B) Volatile or thermally stable
C) Non-volatile or thermally stable
D) Non-volatile or thermally unstable
617. The term "chromatography" came from "chroma" and "graphy" which mean
A) Color writing
B) Colorless
C) Color forming
D) Color spreading
618. Which of the following gases has lowest density at STP?
A) N_2
B) CO
C) Ne
D) NH_3

619. Kinetic molecular theory of gases was given by
A) Bernoulli
B) Clausius
C) Maxwell & Boltzmann
D) All
620. The cooling process based on Joule-Thomson effect is
A) Exothermic
B) Endothermic
C) Both
D) None
621. Plasma is the fourth state of visible matter which constitutes universe nearly
A) 50%
B) 25%
C) 75%
D) 99%
622. Which of the following compounds absorb radiation appreciably below 200 nm?
A) $\text{CH}_2=\text{CH}_2$
B) CH_2COCH_3
C) $\text{CH}_2=\text{CH}-\text{CH}=\text{CH}_2$
D) Both a & b)
623. Inner membrane of the mitochondrion is embedded by
A) the enzymes of the tricarboxylic acid cycle (Krebs' cycle)
B) the components of the electron transport chain
C) glycogen molecules
D) triacylglycerol molecules
624. Breakdown of Liver glycogen is triggered by
A) insulin
B) glucagon
C) adrenaline
D) D) both (B) and (C)
625. Complete oxidation of one gram of carbohydrates yields energy
A) 4 kJ
B) 8 kJ
C) 16 kJ
D) 24 KJ
626. Experimentally Nucleic acids can be analyzed by studying
A) A) molecular weight
B) B) absorption of visible light
C) C) absorption of UV light
D) D) none of these
627. Thymidine
A) A) can participate in hydrophobic interactions due to its methyl group
B) B) is replaced by uracil in RNA
C) C) normally forms two hydrogen bonds with adenosine
D) D) all of the above
628. RNA and DNA contains sugars respectively
A) A) deoxyribose, ribose
B) B) ribose, deoxyribose
C) C) ribose, phosphate
D) D) ribose, uracil
629. Nucleoside is a purine or pyrimidine base is
A) A) covalently bonded to a sugar
B) B) ionically bonded to a sugar
C) C) hydrogen bonded to a sugar

- D) D) none of the above
630. Fragments that will move fast in gel electrophoresis are
- A) A) Large fragments
 - B) B) Small fragments
 - C) C) Large genome
 - D) D) None of these
631. Cholesterol is the precursor of
- A) A) steroid hormones
 - B) B) vitamin A
 - C) C) bile salts
 - D) D) both (A) and (C)
632. In the regulation of fatty acid synthesis the key enzyme is
- A) A) acetyl CoA carboxylase
 - B) B) AMP activated protein kinase
 - C) C) protein phosphatase
 - D) D) none of these
633. In Arachidonate 20 carbon atoms are found with
- A) A) 3 double bonds
 - B) B) 2 double bonds
 - C) C) 4 double bonds
 - D) D) 8 double bonds
634. Triacylglycerols are
- A) A) soluble in water
 - B) B) insoluble in water
 - C) C) soluble in water at elevated temperature
 - D) D) partially soluble in water
635. Animals are unable to convert fatty acids into glucose since
- A) A) acetyl CoA cannot be converted to pyruvate
 - B) B) absence of malate synthase
 - C) C) absence of dehydrogenase
 - D) D) absence of α -ketoglutarate dehydrogenase
636. Fatty acid breakdown in eukaryotes takes place in
- A) A) mitochondrial matrix
 - B) B) Cytosol
 - C) C) cell membrane
 - D) D) endoplasmic reticulum
637. Phospholipid accompany
- A) A) hydrophilic heads and hydrophobic tails
 - B) B) long water-soluble carbon chains
 - C) C) positively charged functional groups
 - D) D) both (B) and (C)
638. Fatty acids is broken down in eukaryotic cells in
- A) A) mitochondrial matrix
 - B) B) cell membrane
 - C) C) Cytosol
 - D) D) endoplasmic reticulum
639. Fertility of soil can be enhanced by
- A) A) Rotation of the crops
 - B) B) Adding lime to the acid salts
 - C) C) Adding manure and growing legumes
 - D) D) All
640. Which statement is not correct about the nitrogen importance?
- A) A) It enhances plant growth
 - B) B) It is involved in the synthesis of protein and nucleic acids
 - C) C) It accelerates fruits and flowers growth

- D) D) It is involved in the chlorophyll synthesis
641. The single nutrient that provides NPK fertilizer is
 A) A) Straight
 B) B) Compound
 C) C) both a and b
 D) D) none of the above
642. Which of following is a macronutrient
 A) A) Cu
 B) B) Cl
 C) C) H
 D) D) Zn
643. When urea is added to the soil, reaction takes place is
 A) A) Endothermic
 B) B) exothermic
 C) C) both a and b
 D) D) no heat energy is involved
644. For ammonia synthesis most suitable catalyst is
 A) A) Pt
 B) B) ZnO + Cr₂O₃
 C) C) Fe in fused mixture of Al₂O₃ + SiO₂ + MgO
 D) D) All of the above
645. Molten urea is cooled by counter air flow in the tower by the process known as
 A) A) Prilling
 B) B) Evaporation
 C) C) Condensation
 D) D) Crystallization
646. paddy rice are not suitable fields for fertilizer that is
 A) A) Urea
 B) B) DAP
 C) C) Ammonium sulphate
 D) D) NH₄NO₃
647. Calcareous material among the following is
 A) A) lime stone
 B) B) marble
 C) C) Chalk
 D) D) All
648. Na₂CO₃ has Enthalpy of solution
 A) -102 kJ/mole
 B) -19.3 kJ/mole
 C) -25.0 kJ/mole
 D) -29.0 kJ/mole
649. Bomb calorimeter measures heat of reaction at
 A) Constant volume
 B) constant pressure
 C) both of them
 D) None of them
650. A calorimeter measures
 A) Heat of reaction
 B) Heat of combustion
 C) Heat of formation
 D) Heat of vaporization
651. Hess's law cannot be used to measure
 A) Heat of combustion
 B) enthalpy charge
 C) heat of dissolution

- D) internal energy
652. Hess's law is just as the
- Law of transformation
 - Law of heat exchange
 - Law of heat summation
 - Law of constant composition
653. Reaction that never stops and move in both directions is
- Reversible reaction
 - Irreversible reaction
 - Equilibrium reaction
 - none of the above
654. $\text{PCl}_5 \rightarrow \text{PCl}_3 + \text{Cl}_2$ here dissociation of phosphorus pentachloride is
- Reversible reaction
 - irreversible reaction
 - incomplete reaction
 - Uni directional
655. As the reaction proceeds the rate of reaction
- Decreases
 - increases
 - remains constant
 - decreases as well increases
656. Bidirectional reaction is also known as
- Reversible reaction
 - exothermic reaction
 - endothermic react
 - Irreversible reaction
657. Reversible reactions proceed in
- Forward direction
 - Backward direction
 - both directions
 - none of the direction
658. Reaction which continues only in one direction up to completion is
- Equilibrium reaction
 - reversible reaction
 - irreversible
 - bidirectional
659. When equilibrium is established the concentration of reactants and products becomes
- Constant
 - different
 - zero
 - same
660. Equilibrium can be expressed most accurately by saying that
- Temperature of opposing reactions is equal
 - Rates of opposing reactions becomes equal
 - Opposing reactions ceases
 - Come of reactants is products are equal
661. Heat energy change at constant temperature and constant pressure is known as
- Enthalpy change
 - heat of sublimation
 - bond energy
 - internal energy changes
662. Relationship between the entities, H, P, ϵ & V is
- $\epsilon = H + PV$
 - $\epsilon = H - P$
 - $H = \epsilon + PV$

- D) $H = E - Pv$
663. Symbol by which standard heat of formation is expressed
- A) ΔH_f
 - B) ΔH_f^0
 - C) ΔH
 - D) ΔE
664. Taking standard heat of formation, the it is considered that heat contents of all the participating elements is
- A) Zero
 - B) positive
 - C) negative
 - D) normal
665. Temperature at which standard enthalpies are taken is
- A) 273 k
 - B) 373k
 - C) 298 k
 - D) 290 k
666. Enthalpy of a system is represents its
- A) Heat content
 - B) energy state
 - C) reaction rate
 - D) activation energy
667. ΔH^0 is measured at the temperature
- A) 0°C
 - B) 25°C
 - C) 100°C
 - D) 150°C
668. The enthalpy change for the reaction of CO and O to form CO_2 has ΔH
- A) -110.53 KJ/mol
 - B) -282.98 KJ/mole
 - C) 393.15 Kj/mole
 - D) 110.53 KJ/mole
669. Heat of formation is positive for
- A) NH_3
 - B) CO_2
 - C) NO
 - D) H_2O
670. Positive values for enthalpy change are for the process of
- A) Neutralization
 - B) Sublimation
 - C) Atomization
 - D) All of the above
671. ΔH_f^0 MgO formation is
- A) -500 kj/mole
 - B) -550 kj/mole
 - C) -692 kj/mole
 - D) -750 kj/mole
672. ΔH_f^0 for CO_2 is
- A) -300.4 kj/mole
 - B) -393.7 kj/mole
 - C) -432.4 kj/mole
 - D) -473.9 kj /mole
673. Useful method for rate determination for reactions which involves volume changes is
- A) Spectrometry
 - B) Conductometry

- C) Dilatometric method
D) Refractometric method
674. Consider a reaction $A \rightarrow B$ showing $\text{Rate} = d[b]/d[t]$ means
A) Concentration of reacting is increasing
B) Concentration of product is increasing
C) No product can be made about concentration of reactants or products
D) Reaction will not taken place
675. To maintain the pH of blood 7.4 what ratio between H_2CO_3 and NaHCO_3 is required
A) 1 : 10
B) 1 : 20
C) 1 : 25
D) 1 : 30
676. Opposite to the osmosis is?
A) Diffusion
B) Effusion
C) Effusion
D) Coagulation
677. Solutions are of type
A) Isotonic solution
B) Hypotonic solutions
C) Hypertonic solution
D) All of these
678. Carrier protein can
A) Transport only one substance
B) Transport more than one substance
C) Exchange one substance to another
D) Perform all of these functions
679. Monosaccharides has the general formula
A) $\text{C}_n\text{H}_{2n}\text{O}_n$
B) $\text{C}_{2n}\text{H}_2\text{O}_n$
C) $\text{C}_n\text{H}_2\text{O}_{2n}$
D) $\text{C}_n\text{H}_{2n}\text{O}_{2n}$
680. Polysaccharides has the general formula
A) $\text{C}_6\text{H}_{10}\text{O}_5)_n$
B) $\text{C}_6\text{H}_{12}\text{O}_5)_n$
C) $\text{C}_6\text{H}_{10}\text{O}_6)_n$
D) $\text{C}_6\text{H}_{10}\text{O}_6)_n$
681. _____ is aldose sugar
A) Glycerose
B) Ribulose
C) Erythrulose
D) Dihydroxyacetone
682. Milk lacks the?
A) Vitamin C
B) Vitamin A
C) Vitamin B2
D) Vitamin K
683. Milk lacks the?
A) Phosphorus
B) Sodium
C) Iron
D) Potassium
684. HDL is synthesized and secreted by?
A) Pancreas
B) Liver

- C) Kidney
D) Muscle
685. Membrane lipid bilayer performs following processes rapidly except
A) Flexing of fatty acyl chains
B) Lateral diffusion of phospholipids
C) Transbilayer diffusion of phospholipids
D) Rotation of phospholipids around their long axes
686. In the cell the heaviest particulate component is?
A) Nucleus
B) Mitochondria
C) Cytoplasm
D) Golgi apparatus
687. In the cytoplasm the largest particulate component is?
A) Lysosomes
B) Mitochondria
C) Golgi apparatus
D) Endoplasmic reticulum
688. Through membrane the exchange of material takes place
A) Only by diffusion
B) Only by active transport
C) Only by pinocytosis
D) All of these
689. Lipid bilayer membrane has phospholipid?
A) Choline phosphoglycerides
B) Ethanolamine phosphoglycerides
C) Inositol phosphoglycerides
D) Serine phosphoglycerides
690. All the following processes occur rapidly in the membrane lipid bilayer except
A) Flexing of fatty acyl chains
B) Lateral diffusion of phospholipids
C) Trans bilayer diffusion of phospholipids
D) Rotation of phospholipids around their long axes
691. In intestinal lumen the surface tension between aqueous medium and fat droplets is suppressed by
A) Bile Salts
B) Bile acids
C) Conc. H_2SO_4
D) Acetic acid
692. Naturally occurring amino acids possesses compounds?
A) A) Guanidinium ion
B) B) Indole
C) C) Imidazole
D) D) All of these
693. The pH of a solution is dependent on
A) A) concentration of salt
B) B) relative concentration of acids and bases
C) C) dielectric constant of the medium
D) D) environmental effect
694. Molecular reactions
A) A) are the reactions of the functional groups
B) B) are independent of the functional groups
C) C) require an enzyme in all cases
D) D) all of the above
695. Example of pentose sugar is
A) Dihydroxyacetone

- B) Ribulose
C) Erythrose
D) Glucose
696. Sugar of DNA is
A) Xylose
B) Ribose
C) Deoxyribose
D) Ribulose
697. Sugar of RNA is
A) Ribose
B) Deoxyribose
C) Ribulose
D) Erythrose
698. Which of following type of column has the greater efficiency and resolution?
A) Packed
B) Non-packed
C) Capillary
D) Steel
699. "Brock Mann Activity Scale" is used chromatography for the characterization of
A) Mobile phase
B) Stationery phase
C) Gradient elution
D) Isocratic elution
700. In thin layer chromatography TLC) which compound will come at the top of the plate?
A) Polar
B) High boiling point
C) Low boiling point
D) Non-polar
701. The composition of soap is the sodium or potassium salts of
A) Essential oils
B) Fatty acids
C) Alcohols
D) Carboxylic acids
702. Commercial glasses are consisting of?
A) soda
B) silica
C) lime
D) all
703. Determinate errors are may also be called as
A) Random
B) Non random
C) Systematic
D) b & c
704. In a chromatogram, there is ————— on x-axis?
A) Retention time
B) Peak splitting
C) Column efficiency
D) Detector Response
705. Which of following is type of adsorption chromatography?
A) Paper
B) TLC
C) GSC
D) None
706. Which of the following cannot be recycled?
A) Plastic wear bottles

- B) Cartoons
 - C) Glass containers
 - D) All can be recycled
707. The branch of science which deals with study of composition of matter is called
- A) Chemistry
 - B) Physics
 - C) Biology
 - D) All
708. Mottling of teeth is caused by?
- A) Cl excess
 - B) F excess
 - C) F deficiency
 - D) Br presence
709. Biodiesel produce from algae is ————— generation fuel?
- A) 1st
 - B) 2nd
 - C) 3rd
 - D) 4th
710. The main advantage of the mass spectrometer detection in GC over the FID is?
- A) Sensitivity
 - B) Identification through compound library
 - C) Linear range
 - D) Dynamic range
711. ————— lamp is useful for variable UV wavelengths in HPL
- A) Hydrogen
 - B) Deuterium
 - C) Xenon
 - D) Tungsten
712. Retention factor, k' , describe
- A) Mobile phase velocity
 - B) Distribution ration of analyte between two phases
 - C) Stationery phase stability
 - D) Migration rate of analyte through a chromatographic column
713. "Triple point" is present in?
- A) GC
 - B) GPC
 - C) SCFE
 - D) TLC
714. On heating a mixture of NaCl potassium dichromate with conc. H_2SO_4 , the compound formed is
- A) Chromic chloride
 - B) Chromyl chloride
 - C) Chlorine dioxide
 - D) Chromic acid
715. In the ring test for nitrate, the brown color of the ring is due to the formation of
- A) Ferrous nitrite
 - B) Ferrous nitrate
 - C) $FeSO_4 \cdot NO$
 - D) $FeSO_4 \cdot NO_2$
716. Which of the following compounds turns black with NH_4OH
- A) Lead chloride
 - B) Mercurous chloride
 - C) Mercuric chloride
 - D) Calcium chloride

717. In which titration experiment phenolphthalein is not used as indicator
- A) Oxalic acid and KMnO_4
 - B) KOH and H_2SO_4
 - C) NaOH and acetic acid
 - D) Ba(OH)_2 and HCl
718. Phenolphthalein is a good indicator for titrating
- A) NaOH against oxalic acid
 - B) Ferrous sulphate against KMnO_4
 - C) NaOH against H_2SO_4
 - D) None of these
719. What will be the resulting solution if a 100 ml of 10N HCl is mixed with 175 ml of 20N NaOH ?
- A) Acidic
 - B) Basic
 - C) Neutral
 - D) None of these
720. What is the mass ratio of oxygen in Pb_3O_4 and PbO_2 ?
- A) 2 : 3
 - B) 3 : 2
 - C) 2 : 1
 - D) 4 : 3
721. IR band at near 3000cm^{-1} is due to
- A) C-C swaying
 - B) C-H swaying
 - C) C=O swaying
 - D) All
722. In IR spectra below 1500cm^{-1} is
- A) Area of C-H swaying
 - B) the area of C=O swaying
 - C) Fingerprint area
 - D) Functional group region
723. 1 Molar phosphoric acid solution will have the normality?
- A) 0.5N
 - B) 1N
 - C) 2N
 - D) 3N
724. The normality of a solution containing 4 g NaOH in 10 ml solution
- A) 10 N
 - B) 1.0 N
 - C) 9.8 N
 - D) 11.0 N
725. Gram equivalent of a solute dissolved per dm^{-3} of solution is called
- A) Molarity
 - B) Normality
 - C) Molality
 - D) Mole fraction
726. The mole fraction of any component of solution is always
- A) Less than unity
 - B) More than unity
 - C) Equal to unity
 - D) Zero
727. In 1 molal solution of ethyl alcohol in water, the mole fraction of $\text{C}_2\text{H}_5\text{OH}$
- A) 0.1
 - B) 0.9
 - C) 0.017

- D) 1.0
728. Hydrolysis of Na_2CO_3 yield the solution
- A) Acidic
 - B) Basic
 - C) Both acidic and basic
 - D) Neither acidic nor basic
729. What is the mole fraction of solvent in one molal solution of sucrose?
- A) 0.475
 - B) 0.982
 - C) 0.658
 - D) 0.789
730. One molar solution of glucose will contain 1 mole glucose in
- A) 100 g of H_2O
 - B) 180 g of H_2O
 - C) 1000g of H_2O
 - D) 1000 ml of H_2O
731. It is preferred to deal with Molality instead of normality because
- A) It is easy to make calculation
 - B) Weights are involved
 - C) Molality does not depend on temperature
 - D) Normality depends upon temperature
732. The molality of 50% aqueous solution of NaOH will be
- A) 2.8m
 - B) 1.25m
 - C) 10.5 m
 - D) 12.5m
733. Water is known as universal solvent due to
- A) High dielectric constant
 - B) Strong intermolecular forces
 - C) It is liquid in nature
 - D) Large quantity in nature
734. Addition of a substance to water followed by breaking of any O-H bond is known as
- A) Hydration
 - B) Hydrolysis
 - C) Solvation
 - D) Hydrogenation
735. When 180g glucose is added to 1000 g of water, the solution formed is
- A) 1.0 molal
 - B) 1.2 molal
 - C) 1.5 molal
 - D) 2.0 molal
736. If we desire to make 1 molal sucrose solution, how much sucrose will be added to 1000 g of water?
- A) 312 g
 - B) 320g
 - C) 340 g
 - D) 342 g
737. If 180g glucose is added to 1000g H_2O resulting solution is 1molal. Mass of solution becomes
- A) 1000g
 - B) 1080 g
 - C) 1180 g
 - D) 1800g
738. When 5g of toluene is added to 250 g of benzene resulting solution has molality?
- A) 0.12 mol/Kg

- B) 0.217 mol/Kg
 C) 0.113 mol/ Kg
 D) 0.34 mol/ Kg
739. The molality of eight percent W/W sodium chloride solution is?
 A) 1.23 molal
 B) 1.487 molal
 C) 2.123 molal
 D) 2.341 molal
740. 1 molal aqueous solution of sucrose has mole fraction?
 A) 0.018
 B) 0.18
 C) 0.012
 D) 0.23
741. Dissolved oxygen in sea water is 5.65×10^{-3} g per Kg. What will be the concentration in parts per million?
 A) 4.45
 B) 4.86
 C) 5.55
 D) 5.65
742. Solution of solid in gas?
 A) Fog
 B) Cheese
 C) Dust in smoke
 D) Opals
743. Solution of liquid in gas is
 A) CO₂ in H₂O
 B) Mist
 C) Jellies
 D) Milk
744. In a conjugate solution of phenol and water the upper layer of phenol water system at 25 °C is solution of water in phenol
 A) 5%
 B) 7%
 C) 9%
 D) 10.10%
745. The lower layer of phenol water system at 25 °C is solution of phenol in water
 A) 10 %
 B) 20%
 C) 30%
 D) 40%
746. When phenol water system becomes a homogenous mixture the percentage is
 A) 55.6%
 B) 60.9%
 C) 65.9%
 D) 70.9%
747. A single layer of water aniline system is obtained at 167.0°C with water having percentage
 A) 10%
 B) 12%
 C) 15%
 D) 17%
748. The correct increasing order of splitting power of ligands according to spectrochemical series is
 A) Cl⁻ < OH⁻ < CN⁻
 B) Cl⁻ < CN⁻ < OH⁻

- C) $\text{OH}^- < \text{Cl}^- < \text{CN}^-$
 D) $\text{OH}^- < \text{CN}^- < \text{Cl}^-$
749. Which of the following titrations will have the equivalence point at a pH more than 8?
 A) HCl and NH_3
 B) CH_3COOH and NH_3
 C) HCl and NaOH
 D) CH_3COOH and NaOH
750. The ideal indicator for the titration of strong acid and weak base should have pH range between
 A) 5-8
 B) 4-6
 C) 8-10
 D) 7-8
751. Which of the following is a buffer solution?
 A) $\text{H}_2\text{SO}_4 + \text{CuSO}_4$
 B) $\text{CH}_3\text{COOH} + \text{CH}_3\text{COONH}_4$
 C) NaCl + NaOH
 D) $\text{CH}_3\text{COONa} + \text{CH}_3\text{COOH}$
752. If an object is present at a distance of 5 km from the surface of the earth, it is present in
 A) Troposphere
 B) Thermosphere
 C) Mesosphere
 D) Stratosphere
753. The equipment to measure atmospheric humidity is
 A) Anemometer
 B) Psychrometer
 C) Hydrometer
 D) Lysimeter
754. What is the maximum number of electrons, which can have following quantum numbers, $n = 3, l = 1, m = -1$?
 A) 2
 B) 6
 C) 10
 D) 4
755. Which ion is kinetically inert?
 A) Cr^{2+}
 B) Co^{3+}
 C) Co^{2+}
 D) Fe^{3+}
756. Which statement about the trans-effect and the trans-influence is correct?
 A) The trans-influence is a ground-state effect, whereas the trans-effect has a kinetic origin
 B) The trans-effect is a ground-state effect, whereas the trans-influence has a kinetic origin
 C) Both the trans-effect and trans-influence are ground-state effects
 D) Rates of substitution are affected by the trans-effect but have nothing to do with the trans-influence of ligands
757. Calculate the mass of hydrogen formed when 25 grams of aluminum reacts with excess hydrochloric acid.

$$2\text{Al} + 6\text{HCl} \longrightarrow \text{Al}_2\text{Cl}_6 + 3\text{H}_2$$

 A) 0.41 g
 B) 1.2 g
 C) 1.8 g
 D) 2.8 g
758. Dissolving a solute in a solvent does not change its
 A) Specific heat

- B) Vapor pressure
 - C) Viscosity
 - D) None of these
759. Applicability of Clausius-Clapeyron Equation is subject to the condition that the
- A) Vapor follows ideal gas law
 - B) Volume in the liquid state is negligible
 - C) Both
 - D) Neither (A) nor (B)
760. Slow plastic deformation of metals under a constant stress is known as
- A) Fatigue
 - B) Proof deformation
 - C) Gradual deformation
 - D) Creep
761. Which of the following zones is used for melting alloy during casting_____?
- A) Reducing flame
 - B) Oxidizing flame
 - C) Green flame
 - D) All of the above
762. Which one of the following is most elastic?
- A) Titanium
 - B) Cobalt
 - C) Chrome-cobalt-nickel
 - D) Nickel-titanium
763. Process in which some minerals are converted to the oxide by heating in the air at a temperature below their melting point is called
- A) Roasting
 - B) Smelting
 - C) Bessemerization
 - D) Concentration
764. Metallic compounds that occur naturally are called
- A) Metal oxides
 - B) Minerals
 - C) Ores
 - D) None of above
765. The Hall-Heroult process is used in the production of:
- A) Mg
 - B) Fe
 - C) Al
 - D) Au
766. Which One of the Following Is Not a Greenhouse Gas?
- A) Methane
 - B) Hydrogen
 - C) Nitrous oxide
 - D) Ozone
767. Normal Greenhouse Effect Is Important for the Sustenance of Life on Earth as it Has Increased the Earth's Surface Temperature By
- A) 15 °C
 - B) 50 °C
 - C) 18 °C
 - D) 33 °C
768. Which One of the Following Is Incorrect About the Greenhouse Effect?
- A) Life on earth is possible due to greenhouse effect
 - B) Greenhouse effect is a natural process that maintains earth's temperature

- C) More is the emission of greenhouse gases, more is the temperature of the earth's atmosphere
 D) Increased emission of greenhouse gases is a natural process
769. Which of the Following Greenhouse Gases Has the Highest Atmospheric Lifetime?
 A) CFC
 B) Nitrous oxide
 C) Methane
 D) Carbon tetrafluoride
770. What is Carbon Sequestration?
 A) Removal of CO₂ from the atmosphere
 B) Storage of CO₂ by depositing in reservoir
 C) Removal of CO₂ from the atmosphere & storing it by depositing in reservoir
 D) None of the above
771. The relative contribution of various greenhouse gases to total global warming will not be
 A) CFCs – 14%
 B) N₂O – 12%
 C) Carbon dioxide – 60%
 D) Methane – 20%
772. When did greenhouse effect discovered?
 A) 1814
 B) 1824
 C) 1854
 D) 1884
773. Which is true about different forms of hydrogen?
 A) Ortho hydrogen has same spins of two nuclei clockwise or anticlockwise
 B) Para hydrogen has different spins of two nuclei
 C) At absolute zero temperature, there is a 100% para form and 75% ortho form
 D) All are correct
774. Alcohol and HF molecule contains _____ & _____ hydrogen bonds.
 A) Intramolecular, intermolecular
 B) Intermolecular, intermolecular
 C) Intermolecular, intramolecular
 D) Intramolecular, intramolecular
775. Red ink is prepared from
 A) Phenol
 B) Aniline
 C) Congo red
 D) Eosin
776. Profilm method is one of the method used to develop for printing.
 A) Blocks
 B) Screens
 C) Fabric
 D) Pigments
777. The treatment that follows printing are termed
 A) Successor process
 B) After treatment
 C) Discharging
 D) Crimping
778. Benzoin oxime is known called.
 A) Dioxime
 B) Cupron
 C) Cupric acid
 D) None of them
779. Chose the indicator for Cu-EDTA titration.

- A) Thymol blue
 - B) Phenolphthalein
 - C) Murexide
 - D) None of them
780. For gold plating which electrolyte is used.
- A) $[K(Au(NH_3)_2)]$
 - B) $[K(Au(CN)_2)]$
 - C) $[K(Ag(NH_3)_2)]$
 - D) None of them
781. Which one is diamagnetic in nature?
- A) $[Co(NH_3)_6]^{3+}$
 - B) $[Pt(NH_2)_2]^{3+}$
 - C) $[Ru(CN)_6]$
 - D) None of them
782. How does the hot water or steam escape through earth surface?
- A) Through fissures
 - B) Through Pot holes
 - C) From Wells
 - D) Through water bodies
783. Which of the following statements is true for hydrothermal methods?
- A) It uses temperature above its cooling point
 - B) It uses temperature below its cooling point
 - C) It uses temperature above its boiling point
 - D) It is not at all related with the temperature
784. Which one of the following is high pressure polymorphs of SiO_2 ?
- A) Wurtzite
 - B) Phenacite
 - C) Quartz
 - D) Stishovite
785. In nitroprusside ion the iron and NO exists as Fe (II) and NO^+ rather than Fe (III) and NO. These forms can be differentiated by
- A) Estimating the concentration of iron
 - B) Measuring the concentration of CN
 - C) Measuring the solid state magnetic moment
 - D) Thermally decomposing the compound
786. Viscosity of blood increased with rise in levels
- A) Albumin
 - B) Globulin
 - C) Fibrinogen
 - D) Prothrombin
787. Average RBC count in an adult male is
- A) 4.5 million/ mm^3
 - B) 5 million/ mm^3
 - C) 5.5 million/ mm^3
 - D) 6 million/ mm^3
788. The compounds having same structural formula but differing in configuration around one carbon atom are called
- A) Optical isomers
 - B) Anomers
 - C) Stereo isomers
 - D) Epimers
789. Each colloid particle has a definite charge, it may be cation or anion so fixed layer constitute by
- A) Single charged layer
 - B) Double opposite charged layer

- C) Mobile and immobile layer
 D) None of the above
790. On the basis of the state of the dispersion medium colloids are
 A) Sol and gel type
 B) Lyophilic and lyophobic type
 C) saturated and unsaturated type
 D) None of the above
791. Following are the blood buffers except
 A) haemoglobin
 B) phosphate
 C) plasma proteins
 D) bicarbonate
792. The normal stored form of iron in liver and spleen is
 A) Transferrin
 B) Apo ferritin
 C) Ferritin
 D) Hemosiderin
793. Which of the following solutions contains the greatest amount of solute?
 A) 30.0 cm³ of 0.30 mol dm⁻³ NaCl
 B) 10.0 cm³ of 0.50 mol dm⁻³ NaCl
 C) 20.0 cm³ of 0.40 mol dm⁻³ NaCl
 D) 40.0 cm³ of 0.20 mol dm⁻³ NaCl
794. 50 mL of 0.02 M NaOH is added to 50 mL of 0.04 M HCl solution. The pH of the resulting solution will be...
 A) 7
 B) 2
 C) 1.7
 D) 1
795. H₂S will precipitate the sulphides of all the metals from the solution of chlorides of Cu, Zn and Cd, if
 A) The solution is aqueous
 B) The solution is acidic
 C) The solution is dilute acidic
 D) Any of these solutions is present
796. Which reagent below would enable you to remove sulphate ions from a solution containing both sulphate and chloride ions
 A) Sodium hydroxide
 B) Barium hydroxide
 C) Barium sulphate
 D) Potassium hydroxide
797. The ion that cannot be precipitated by both HCl and H₂S is
 A) Pb²⁺
 B) Cu⁺
 C) Ag⁺
 D) Sn²⁺
798. To an inorganic mixture dil. H₂SO₄ is added in cold; colourless, odourless gas is evolved. The mixture contains
 A) Sulphite
 B) Acetate
 C) Nitrite
 D) Carbonate
799. Which of these non-metals is commonly used in fire-crackers?
 A) Silicon
 B) Neon
 C) Sulphur

- D) Fluorine
800. Mid-IR region ranges from
- A) 14000-400 cm^{-1}
 - B) 400-10 cm^{-1}
 - C) 6000-400 cm^{-1}
 - D) 4000-400 cm^{-1}
801. Single band near 3000 cm^{-1} is a specific band for identification of
- A) Alcohols
 - B) Alkanes
 - C) Alkenes
 - D) Amine
802. In the first chromatography experiment by Tswett separated?
- A) Xanthophyll
 - B) Beta carotene
 - C) Colors
 - D) Chlorophyll
803. Electronic excitations are studied using
- A) UV
 - B) Fluorescence
 - C) Visible
 - D) All above
804. The lighter source in visible spectrophotometer is
- A) Tungsten lamp
 - B) Mercury
 - C) Hydrogen gas lamp
 - D) Deuterium discharge lamp
805. Which of following laboratory material has highest working temperature
- A) Borosilicate
 - B) Quartz glass
 - C) Fused silica
 - D) Platinum
806. Which radiations are due to vibrational changes
- A) UV
 - B) Visible
 - C) Infrared
 - D) Microwave
807. Electromagnetic radiation moves in which plane
- A) Horizontal
 - B) Vertical
 - C) Both
 - D) Outward
808. _____ is / are allowed transitions?
- A) π - π^*
 - B) σ - σ^*
 - C) π - σ^*
 - D) B & C
809. Which radiations are known as inner shell radiations?
- A) UV
 - B) Visible
 - C) Infrared
 - D) X-ray
810. The atoms of the molecules do not move during electronic transitions.
- A) Beer-Lamberts law
 - B) Maxwell Principal
 - C) Faraday Principal

D) Frank Condon Principal

811. Sugar juice can be purified and concentrated by?

- A) Vacuum distillation
- B) distillation
- C) Fractional crystallization
- D) sublimation

812. In which method of steam distillation, the vapor pressure of volatile organic compound becomes?

- A) less than atmospheric pressure
- B) Equal to atmospheric pressure.
- C) More than atmospheric pressure
- D) None of these

813. Hexane and acetone present in mixture can be purified or separated by?

- A) Steam distillation
- B) Hydro distillation
- C) Vacuum distillation
- D) Fractional distillation

814. An organic compound present in water can be easily separated by?

- A) Evaporation
- B) Solvent extraction.
- C) Distillation
- D) Steam distillation

815. Fractional distillation is useful to separate liquids with a difference in their boiling point at least of?

- A) 5 °C
- B) 25°C
- C) 30 °C
- D) 15 °C

816. Two liquids can be separated by steam distillation is difference in their boiling points is more than?

- A) 20 °C
- B) 10 °C
- C) 30 °C
- D) 2 °C

817. Chromatographic methods are useful to separate?

- A) Color compounds
- B) Volatiles
- C) Stable compounds
- D) All of these.

818. Non-volatiles cannot be separated and analyzed using?

- A) HPLC
- B) GC
- C) Ion-exchange
- D) Column chromatography

819. Halogen can be estimated by?

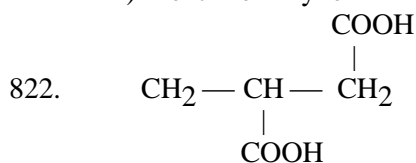
- A) Duma's method.
- B) Carius method
- C) Leibig's method
- D) All of the above

820. Nitrogen in organic compounds can be analyzed by?

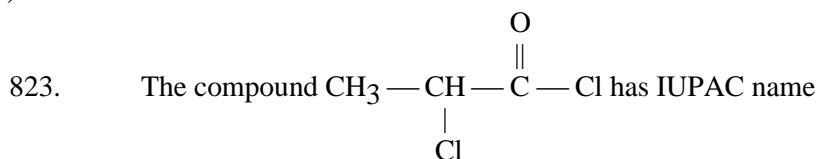
- A) Duma's method
- B) Carius method
- C) Beibigs method
- D) None of these.

821. IUPAC name of compound $C=C-C-C\equiv C$

- A) 1-pentene-4-yne
- B) 4-pentene-1-yne
- C) Pent-1-en-4-yne
- D) Pent-4-en-1-yne



- A) Butane-1,2,4-tricarboxylic acid
- B) Hexane trioxic acid
- C) 3-carboxy hexane-1,6-dioic acid
- D) None of these



- A) 2-chloropropanoyl chloride
- B) 1,2-dichloropropanone
- C) Chloroformyl chloroethane
- D) 1,2-dichloropropanal

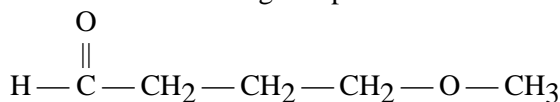
824. The compound $C_2H_5OCH_2CH_2CH_2CH_2OCH_3$ IUPAC name is

- A) Ethoxy butane oxymethane
- B) 2,6-dioxy heptane
- C) 3-ethoxy,1-methoxy butane
- D) 1-methoxy,3-ethoxy butane

825. The name of $CH_3-CH=CH=CHO$ the compound is

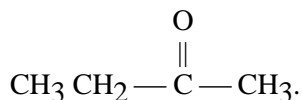
- A) Prop-2-ene-1-al
- B) Crotonaldehyde
- C) Butenal
- D) Butene-1-al

826. The following compound has IUPAC name



- A) 2-formyl methoxy propane
- B) 2-methoxy butanal
- C) Methoxy butanal
- D) 4-methoxy butanal

827. The IUPAC name of compound



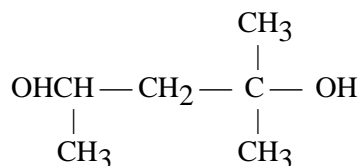
- A) 2-Butanone
- B) Butanone-2
- C) Butane-one
- D) All are correct

828. The following compounds has IUPAC name
$$\begin{array}{cccc} \text{CH}_2 & - \text{CH} & - \text{CH} & - \text{CH}_2 \\ | & | & | & | \\ \text{CN} & \text{CN} & \text{CN} & \text{CN} \end{array}$$

- A) 1,2,3,4-cyano butane
- B) 1,2,3,4-tetracyano butane

- C) 3,4-dicyanohexane-1,t-dinitrile
 D) None of these

829. IUPAC name of



- A) 3-methyl butanol
 B) 4-methyl-2,4-pentanediol
 C) 2-methyl-2,4-pentanediol
 D) None of these
830. Acraldehyde has IUPAC name
- A) Propenal
 B) Butanal
 C) Prop-2-en-1-al
 D) None of these

831. A neutral molecule having the general formula AB₃ has two unshared pair of electrons on A. What is the hybridization of A?

- A) sp
 B) sp²
 C) sp³
 D) sp³d

832. A π (pi) bond is the result of the

- A) overlap of two s orbitals.
 B) overlap of an s and a p orbital.
 C) overlap of two p orbitals along their axes.
 D) sidewise overlap of two parallel p orbitals.

833. A triple bond contains ___ sigma bond(s) and ___ pi bond(s).

- A) 0, 3
 B) 3, 0
 C) 2, 1
 D) 1, 2

834. Among the following, the linear molecule is

- A) CO₂
 B) NO₂
 C) SO₂
 D) ClO₂

835. Two optical isomers are formed from carbon atoms to create bond

- A) 4 atoms
 B) 2 atoms
 C) 1 atom
 D) 3 atoms

836. There is a difference in effect of optical isomer on

- A) heat
 B) temperature
 C) polarized light
 D) pressure

837. Types of stereoisomerism are optical isomerism and

- A) cis-isomerism
 B) trans-isomerism
 C) cis-trans isomerism
 D) all of them

838. Compounds which have different arrangements of atoms in space while having same atoms bonded to each other are said to have
- A) position isomerism
 - B) functional group isomerism
 - C) chain isomerism
 - D) stereoisomerism
839. Types of structural isomerism are
- A) position isomerism
 - B) functional group isomerism
 - C) chain isomerism
 - D) all of them
840. Compounds which have same molecular formula but different structural formula is called
- A) structural isomer
 - B) molecular isomer
 - C) optical isomer
 - D) position isomer
841. When one hydrogen atom of alkane is removed then it is called
- A) Alkene
 - B) Alkyl
 - C) Aldehyde
 - D) Saturated hydrocarbon
842. Alkanes are also known as
- A) Saturated hydrocarbon
 - B) Unsaturated hydrocarbon
 - C) Paraffins
 - D) Both a & c
843. Sabatier Senderns reaction involve _____ in presence of Ni
- A) Alkene and H_2
 - B) Alkene and O_2
 - C) Alkene and N_2
 - D) Alkyne and Cl_2
844. Hydrogenolysis results in the formation of
- A) Alkane
 - B) Alkene
 - C) Alkyne
 - D) Aldehyde
845. Clemmensen's reduction involves the reduction of
- A) Ketone
 - B) Aldehyde
 - C) Alkane
 - D) all of above
846. Soda lime is a mixture of
- A) CaO and KOH
 - B) CaO and $NaOH$
 - C) $NaOH$ and Na_2O
 - D) Na_2O and KOH
847. Removal of CO_2 is called
- A) Carboxylation
 - B) Decarboxylation
 - C) Esterification
 - D) Hydroxylation
848. Molozonide is unstable and changes into ozonide on
- A) Reduction
 - B) Oxidation

- C) Hydrolysis
D) Rearrangement
849. Due to presence of double bond alkenes are
A) Unsaturated
B) Saturated
C) Polar
D) non-polar
850. R-Mg-Br is called
A) Grignard reagent
B) Metallic alkyl halide
C) Both a & b
D) Alkyl
851. In Friedel Craft reaction, AlCl₃ is used to give?
A) Weak nucleophile
B) Weak electrophile
C) Strong electrophile
D) Strong nucleophile
852. Benzene ring is activated by?
A) Ortho directors
B) Ortho and para directors
C) Ortho and meta directors
D) Meta directors
853. Oxidation of benzoic acid with acidified KMnO₄ or K₂Cr₂O₇ produces?
A) n-propyl benzene
B) toluene
C) ethyl benzene
D) All
854. Which is a meta directing?
A) C₂H₅
B) NHR₂
C) COOH
D) Br
855. Which one is the molecular formula of benzal chloride?
A) C₆H₅CH₂Cl
B) C₆H₅CH=CHCl
C) C₆H₅CHCl₂
D) None
856. Ortho and para directing group is?
A) COOR
B) COR
C) CHO
D) I
857. Benzenetrizonide hydrolysis yields three moles of?
A) Glyoxal
B) Gluoxime
C) Glycol
D) Benzaldehyde
858. Organic Compounds are most likely to?
A) Not burn in air
B) Contain covalent bonds
C) Soluble in water
D) High melting points
859. Benzene ozonolysis produces?
A) Vicinal diol

- B) Glycol
C) Glyoxal
D) Both b & c
860. The propane combustion products are?
A) $3\text{CO}_2 + 4\text{H}_2\text{O}$
B) $3\text{CO}_2 + 4\text{H}_2\text{O}$
C) $3\text{CO} + 4\text{H}_2\text{O}$
D) $2\text{CO}_2 + 4\text{H}_2\text{O}$
861. Ethanol can be converted into ethanoic acid by
A) Hydrogenation
B) Hydration
C) Oxidation
D) Fermentation
862. Methyl alcohol is not used
A) As a solvent
B) As an antifreezing agent
C) As a substitute for petrol
D) For denaturing of ethyl alcohol
863. Methanol can be obtained from
A) water gas
B) destructive distillation of wood
C) methane
D) all
864. An alcohol which can be prepared by fermentation is
A) CH_3OH
B) $\text{C}_3\text{H}_7\text{OH}$
C) $\text{CH}_3 - \text{CH}_2 - \text{OH}$
D) $\text{C}_6\text{H}_5\text{OH}$
865. Phenol was isolated by Runge from
A) vegetable oil
B) coaltar
C) wood
D) none of these
866. Which one of the following compounds does not have - OH group
A) ethylene glycol
B) glycerol
C) picric acid
D) ethyl acetate
867. The hydrogenation of phenol in the presence of Ni and heat gives
A) cyclohexane
B) n - hexane
C) 1 - hexanol
D) cyclohexanol
868. Ethanol and methanol can be distinguished by a
A) Iodoform test
B) Luca's test
C) Benedict's test
D) Tollens test
869. Which one of the following alcohols has greater boiling point
A) ethanol
B) ethylene glycol
C) glycerol
D) methanol

870. The distinguish among primary, secondary and tertiary alcohols, one would use the following experimental method.
- A) Sandmeyer reaction
 - B) Witting reaction
 - C) Ninhydrin test
 - D) None of these
871. Which of the following reagents may be used to distinguish between phenol and benzoic acid?
- A) Neutral FeCl_3
 - B) Aqueous NaOH
 - C) Tollen's reagent
 - D) Molisch reagent
872. The conversion of m-nitrophenol to resorcinol involves respectively
- A) Diazotization, reduction and hydrolysis
 - B) Hydrolysis, diazotization and reduction
 - C) Reduction, diazotization and hydrolysis
 - D) Hydrolysis, reduction and diazotization
873. Which compound is also known by the name of carbolic acid?
- A) $\text{C}_2\text{H}_5\text{OH}$
 - B) H_2CO_3
 - C) $\text{C}_6\text{H}_5\text{OH}$
 - D) H_3PO_3
874. The given dissociation constant (K_a) value 1.3×10^{-10} is of
- A) Alcohol
 - B) Acetic acid
 - C) Water
 - D) Phenol
875. Heating phenol with Zn will yield
- A) Benzene
 - B) Benzoic acid
 - C) Phenoxide
 - D) Cyclohexane
876. Treating phenol with formaldehyde in the presence of dilute base forms Bakelite. The process involved is
- A) Oxidation
 - B) Elimination
 - C) Condensation polymerization
 - D) Additional polymerization
877. Phenol was isolated by Runge from
- A) Vegetable oil
 - B) Coaltar
 - C) Wood
 - D) None of these
878. The hydrogenation of phenol in the presence of Ni and heat gives
- A) Cyclohexane
 - B) n-Hexane
 - C) 1-Hexanol
 - D) Cyclohexanol
879. Phenol is readily soluble in
- A) Water
 - B) Organic solvents
 - C) Inorganic solvents
 - D) All of these
880. o-Nitrophenol is
- A) Volatile

- B) Steam volatile
C) Non-volatile
D) Non of these
881. Organic compounds which contains halogens is
A) PVC
B) polyvinyl chloride
C) poly chloro ethene
D) all of them
882. Which of the following would not be a reasonable nucleophile in a SN2 reaction?
A) NH
B) NC⁻
C) H₂O
D) HO⁻
883. Which of the following halides will react most rapidly in a SN2 reaction?
A) CH₃F
B) CH₃Cl
C) CH₃Br
D) CH₃I
884. Chlorobenzene is prepared commercially by
A) Dow's process
B) Deacon's process
C) Raschig process
D) Etard's process
885. Aryl halides are less reactive towards nucleophilic substitution reaction as compared to alkyl halides due to
A) The formation of less stable carbonium ion
B) Resonance stabilization
C) Longer-carbon-halogen bond
D) Both (1) and (2)
886. Which of the following factors does not favour SN1 mechanism?
A) Strong nucleophile
B) Polar solvent
C) Low concentration of nucleophile
D) alkyl halide
887. Which of the following is the correct order of decreasing reactivity towards nucleophilic substitution?
A) Vinyl chloride > Allyl chloride > Propyl chloride
B) Propyl chloride > Vinyl chloride > Allyl chloride
C) Alkyl chloride > Vinyl chloride > Propyl chloride
D) Allyl chloride > Propyl chloride > Vinyl chloride
888. The organic chloro compound, which shows complete stereochemical inversion during a SN2 reaction, is
A) CH₃Cl
B) (C₂H₅)₂CHCl
C) (CH₃)₃CCl
D) (CH₃)₂CHCl
889. CH₃-CH₂-Br on treatment with LiAlH₄ gives ethane gas while (CH₃)₃C-Br on same treatment gives H₂ gas because
A) The former is SN2 and later is E2 reaction
B) The former is E2 and later is SN2 reaction
C) The former is SN1 and later is E2 reaction
D) The former is E2 and later is SN2 reaction
890. Which one of the following statements is wrong?
A) Lower alkyl halides are either colourless gases or volatile liquids
B) Alkyl halides are highly soluble in water

- C) Alkyl halides burn easily with green edged flame
D) The higher alkyl halides are colourless solids
891. Tamarinds contain major quantities of following acid?
A) Citric acid
B) Tartaric acid
C) Acetic acid
D) Butyric acid
892. Sour milk contains which acid?
A) Citric acid
B) Tartaric acid
C) Acetic acid
D) Butyric acid
893. What is the common name of ethanoic acid?
A) Acetic acid
B) Ethanic acid
C) Formic acid
D) Propionic acid
894. Benzoic acid is a?
A) Strong acid
B) Weak base
C) Salt
D) Weak acid
895. Artificial fruity smell and flavors of food are due to?
A) Alcohols
B) Aldehydes
C) Ketones
D) Esters
896. _____ (IUPAC name) is product of butyric acid and ethanol.
A) Ethyl butyrate
B) Methyl pentanoate
C) Butyl ethanoate
D) Ethyl butanoate
897. Amine acts as _____ in distilled water.
A) Strong acid
B) Weak base
C) Salt
D) Neutral
898. Nicotine, caffeine, and morphine are?
A) Alcohols
B) Aldehydes
C) Amides
D) Carboxylic acids
899. Semicarbazide is a half _____ and half _____.
A) Alcohols, acid
B) hydrazide, amide
C) Ketones, hydrazide
D) Carboxylic acid, amide
900. Malonic acid on continuous heating for long time produce?
A) Acetic acid
B) Ethanoic acid
C) Propanoic acid
D) Formic acid
901. Benzamide on treatment with POCl_2 gives.
A) Aniline

- B) Benzonitrile
 - C) Chlorobenzene
 - D) Benzyl amine
902. When benzene sulphonic acid and *p*-nitrophenol are treated with NaHCO₃, the gases released respectively, are.
- A) SO₂, NO₂
 - B) SO₂, NO
 - C) SO₂, CO₂
 - D) CO₂, CO₂
903. When - COOH is attached directly to the benzene ring the acid is called:
- A) Aliphatic
 - B) Alicyclic
 - C) Carboxylic
 - D) Aromatic
904. The common name of propane 1 3-dioic is.
- A) Oxalic acid
 - B) Aromatic acid
 - C) Malonic acid
 - D) Fumaric acid
905. The common thing in phthalic acid and oxalic acid is that both are.
- A) Aromatic
 - B) Dicarboxylic
 - C) Hydrocarbons
 - D) Strong acids
906. The irritation caused by red ants bite is due to?
- A) Lactic acid
 - B) Formic acid
 - C) Uric acid
 - D) Acetic acid
907. The acid which is used as ink remover is.
- A) Oxalic acid
 - B) Succinic acid
 - C) Adipic acid
 - D) Acetic acid
908. Which of the following is the strongest acid?
- A) Water
 - B) Formic acid
 - C) Acetic acid
 - D) Propanoic acid
909. Synthetic rubber is prepared by.?
- A) Acetic acid
 - B) Formic acid
 - C) Carbonic acid
 - D) Benzoic acid
910. Acidic amino acids have.
- A) 2 amino groups and 1 carboxylic group
 - B) 1 amino and 1 carboxylic groups
 - C) 2 carboxylic groups and 1 amino group
 - D) 2 amino and 2 carboxylic groups
911. NH₃ molecule with a lone pair of electrons on nitrogen atom has a shape of
- A) Tetrahedral
 - B) Trigonal pyramidal
 - C) Angular
 - D) Square planar

912. One Debye is equal to
- A) 1.66×10^{-24} C) m.
 - B) 9.1×10^{-31} C) m.
 - C) 6.02×10^{-23} C) m.
 - D) 3.336×10^{-24} C) m.
913. Which of following orbitals is associated with lowest energy?
- A) Atomic
 - B) Bonding molecular
 - C) Antibonding molecular
 - D) b and c
914. A bond with maximum covalent character is formed between
- A) Chemically similar atoms
 - B) Atoms of different electronegativity
 - C) Atoms of different size
 - D) Identical atoms
915. Among the following molecules the shortest carbon to carbon distance is in
- A) $\text{CH}_3\text{-CH}_3$
 - B) $\text{CH}_2 = \text{CH}_2$
 - C) $\text{CH} \equiv \text{CH}$
 - D) $\text{CH}_3\text{-CH}_2\text{-CH}_3$
916. Which of the following has highest ionization potential?
- A) Li
 - B) Na
 - C) K
 - D) Rb
917. Which of the following conducts electricity due to the movement of ions?
- A) Molten sodium chloride
 - B) Co
 - C) Graphite
 - D) Mercury
918. The example of non-polar molecule with polar bonds is
- A) HCl
 - B) H_2O
 - C) SO_3
 - D) SO_2
919. Which of following molecules has shortest carbon to carbon bond length?
- A) $\text{C} \equiv \text{C}$
 - B) $\text{C} = \text{C}$
 - C) C-C
 - D) All are same
920. Which of following pair of molecules is paramagnetic in nature?
- A) O_2 and B_2
 - B) N_2 and O_2
 - C) N_2 and F_2
 - D) H_2 and N_2
921. Among the following chemical species bond order of _____ highest?
- A) H_2
 - B) H_2^+
 - C) H_2^-
 - D) All have same bond order
922. More stable products are obtained by a reaction which is
- A) Endothermic
 - B) Exothermic
 - C) Isothermal
 - D) Simple

923. The energy is transferred from one body to an other in the form of
- A) Heat
 - B) Work
 - C) Mechanical work
 - D) All above
924. Which one of the following enthalpies is always an exothermic process?
- A) Enthalpy of atomization
 - B) Enthalpy of neutralization
 - C) Enthalpy of ionization
 - D) Enthalpy of dissociation
925. When a strong acid reacts with a strong base the heat of neutralization in KJ/mol) is
- A) +218
 - B) -57.4
 - C) +51.1
 - D) -25.0
926. Ethanol burns with heat of combustion in KJ/mol)
- A) -1368
 - B) -57.4
 - C) -285.5
 - D) -285.5
927. In how many ways energy transfer from a system can occur?
- A) One
 - B) Two
 - C) Three
 - D) Four
928. What is the SI unit of work?
- A) Newton
 - B) Joule
 - C) Calorie
 - D) Watt
929. Evaporation of water is ————— process
- A) Endothermic
 - B) Exothermic
 - C) Non-energetic
 - D) Slow
930. The heat of combustion is measured by
- A) Calorimeter
 - B) Colorimeter
 - C) Bomb calorimeter
 - D) Spectrophotometer
931. Unit of K_w are
- A) mole dm^{-3}
 - B) $\text{mol}^2 \text{dm}^{-3}$
 - C) $\text{mol}^2 \text{dm}^{-6}$
 - D) $\text{mol}^2 \text{dm}^{+3}$
932. Which of the followings can explain the buffer action?
- A) Common ion effect
 - B) Law of mass action
 - C) Le-Chatlier's Principle
 - D) All above
933. Which is the strongest bond?
- A) C-C
 - B) C-H
 - C) C-N
 - D) C-F

934. The radius of _____ is smaller than its parent atom.
- A) Ion
 - B) Cation
 - C) Anion
 - D) All
935. A polar bond is _____ than a non-polar bond.
- A) Stronger
 - B) Same in strength
 - C) Weaker
 - D) All
936. The empirical formula and molecular formula of a chemical substance could be
- A) Different
 - B) Identical
 - C) Both (a & b)
 - D) Ambiguous
937. One mole of Carbon (^{12}C) is equivalent to
- A) 0.0112 kg
 - B) 1 kg
 - C) 120g
 - D) 12 g
938. Which of the following compounds has highest nitrogen contents?
- A) NH_3
 - B) N_2H_4
 - C) NO
 - D) NH_4OH
939. One mole of H_2O contains
- A) 81 g
 - B) 6.02×10^{23} atoms
 - C) 6.02×10^{23} molecules
 - D) 6.02×10^{23} ions
940. Chlorine (Cl) and chloride (Cl^-)
- A) Are chemically identical
 - B) Are allotropes
 - C) Have same number of electrons
 - D) Have same number of protons
941. X-ray diffraction work shows that the diameters of the individual atoms are of the order of
- A) 2×10^{-10} m
 - B) 2×10^{-8} m
 - C) 2×10^{-6} m
 - D) 2×10^{-4} m
942. Formation of a negative ion is a type of reaction
- A) Exothermic
 - B) Endothermic
 - C) Adiabatic
 - D) Isothermal
943. Sublimation can be defined as
- A) Formation of a solution
 - B) Volatile liquid
 - C) Conversion of solid directly into vapors
 - D) Conversion of solid to liquid
944. A crucible made of porcelain with a perforated bottom is called?
- A) Gooch crucible
 - B) Whatman crucible
 - C) Glass crucible

- D) All
945. Separation of an insoluble solid from a liquid phase is done by
- A) Sublimation
 - B) Vaporization
 - C) Condensation
 - D) Filtration
946. The process of separation of crystals from the mother liquor is called
- A) Crystallization
 - B) Condensation
 - C) Vaporization
 - D) Filtration
947. Which of following is truly is Avogadro constant
- A) Atoms in 1g of helium gas
 - B) Molecules in 35.5g chlorine gas
 - C) Electrons needed to deposit 24g magnesium ions
 - D) Atoms in 24g of magnesium
948. Isotopes of an element do not have
- A) Same chemical properties
 - B) Same number of electrons
 - C) Same number of protons
 - D) Same number of neutrons
949. Which of the following will be heaviest?
- A) 2 mol N₂
 - B) 1 mol of O₃
 - C) 2 mol of O₂
 - D) 2 mol of CO₂
950. CO⁺ is an example of
- A) Stable molecule
 - B) Cationic molecular ion
 - C) Anionic molecular ion
 - D) Free radical
951. What is the number of covalent bonds in 0.001Kg of ammonia are
- A) 6.02×10^{23}
 - B) 1.062×10^{23}
 - C) 10.62×10^{24}
 - D) 1.062×10^{24}
952. Electron microscopes are based upon interaction of objects with
- A) Ultraviolet light
 - B) visible light
 - C) Infrared light
 - D) X-rays
953. Paper chromatography can be performed in
- A) Radial
 - B) Descending
 - C) Ascending
 - D) All
954. In chromatography the K stands for
- A) Rate Law
 - B) Rate
 - C) Distribution coefficient
 - D) Both a & b
955. If the stationary phase is solid then it is called
- A) Adsorption chromatography
 - B) Partition chromatography
 - C) Gas chromatography

- D) Paper chromatography
956. Which of the following gas diffuses most rapidly
- A) Cl_2
 - B) N_2
 - C) CH_4
 - D) CO_2
957. On temperature scale the absolute zero is equal to
- A) -273.15K
 - B) -273.15°C
 - C) -237.15°C
 - D) -273°C
958. In SI units the value of gas constant is
- A) $2.987 \text{ atm dm}^3\text{K}^{-1}\text{mol}^{-1}$
 - B) $8.314 \text{ atm dm}^3\text{K}^{-1}\text{mol}^{-1}$
 - C) $1.987 \text{ atm dm}^3\text{K}^{-1}\text{mol}^{-1}$
 - D) $8.313 \text{ N-m K}^{-1}\text{mol}^{-1}$
959. van der Waal's weak intermolecular forces are present in
- A) Only gases
 - B) Only liquids
 - C) Only solids
 - D) All
960. Rydberg constant is a fundamental constant of atomic physics and has value of
- A) $1.6 \times 10^7 \text{ m}^{-1}$
 - B) $1.7904 \times 10^7 \text{ m}^{-1}$
 - C) $1.09768 \times 10^7 \text{ m}^{-1}$
 - D) $1.9678 \times 10^7 \text{ m}^{-1}$
961. Poison for platinum catalyst is?
- A) Arsenic
 - B) Silver
 - C) Argon
 - D) Zinc
962. Catalyst usually belongs to block elements
- A) s
 - B) p
 - C) d
 - D) f
963. The substance that lowers the efficiency of catalyst are called
- A) Promoters
 - B) Inhibitors
 - C) Both promoters & inhibitors
 - D) Speeders
964. The chemical substance which increase the effect of catalyst
- A) promoters
 - B) inhibitors
 - C) Both promoters & inhibitors
 - D) Speeders
965. The pH of water is greater at temperature
- A) 14°C
 - B) 15°C
 - C) 18°C
 - D) 25°C
966. A reaction has rate equation $\text{rate} = k [\text{NO}_2]^2$, it is
- A) First order
 - B) Second order

- C) Third order
D) Zero order
967. $2\text{H}_2 + 2\text{NO} \rightarrow 2\text{H}_2\text{O} + \text{N}_2$ order for this reaction is
A) 1
B) 2
C) 3
D) 4
968. By the use of catalyst energy of activation is
A) Lower
B) Higher
C) Increased
D) Released
969. By adding suitable catalyst, reaction rate is
A) Increases
B) Decreases
C) Remains constant
D) Increase as well as decrease
970. A substance that effect the rate of reaction but remains unaltered at the end of reaction is called
A) Acid
B) Base
C) Catalyst
D) Activator
971. Reaction cannot be initiated by a catalyst but only its speed can be increased which is possible
A) Physically
B) Thermodynamically
C) Chemically
D) In laboratory
972. The catalysts are of
A) Two types
B) Three types
C) Five types
D) Four types
973. The branch of chemistry in which reaction rates are studied is known as
A) Chemical kinetics
B) Chemical equilibrium
C) Electrochemistry
D) Thermochemistry
974. The study of chemical kinetics becomes highly complicated if there occurs
A) Reversible reaction
B) Surface reaction
C) Side reaction
D) Any or all above
975. To explain the subject of chemical kinetics which theories has been proposed
A) Collision theory of bimolecular reactions
B) Absolute reaction rates or activated complex theory
C) Both of these
D) None of these
976. A chemical reaction has characteristic?
A) Concentration
B) Temperature
C) Catalyst
D) All of the above

977. Which of the following is not the characteristic of balanced thermochemical equation
- A) Number of moles of various species
 - B) Formulae of the species
 - C) State of species
 - D) Condition of T and P
978. That reaction which progresses slowly showing measurable rate is known as
- A) Slow reaction
 - B) Fast reaction
 - C) Moderate reaction
 - D) None of these
979. As compared to non-ionic reactions Ionic reaction are
- A) Slower
 - B) moderate
 - C) Faster
 - D) not faster
980. The most famous polymers make the foam are?
- A) poly urethane
 - B) polyamide
 - C) polyester
 - D) none of these
981. Non-volatile film forming constituents of the paints are
- A) pigments
 - B) driers
 - C) drying oils
 - D) thinners
982. The corrosion of metal involves?
- A) chemical reaction
 - B) physical reaction
 - C) both a and b
 - D) none
983. A potable water has the turbidity value?
- A) 5 NTU
 - B) 10 NTU
 - C) 50 NTU
 - D) 15 NTU
984. What is the carbon range in the naphtha?
- A) C1-C5
 - B) C6-C10
 - C) C1-C4
 - D) C5-C12
985. The crude oil is treated with copper oxide to remove?
- A) Salt
 - B) mud
 - C) sulphur
 - D) all of these
986. A good coal should have:
- A) moisture content

- B) ash content
 - C) volatile matter
 - D) fixed carbon content
987. Producer gas is mixture of:
- A) CO+ H₂
 - B) CO+ CH₄
 - C) CO+ N₂
 - D) CH₄+H₂
988. A fuel gas which is also used as a source of hydrogen is
- A) producer gas
 - B) water gas
 - C) coal gas
 - D) natural gas
989. Which of the coal has highest percentage of carbon?
- A) peat
 - B) bitumen
 - C) anthracite
 - D) lignite
990. Cermits are sintered materials, consisting of mixtures of?
- A) Ceramics and clay
 - B) ceramics and water
 - C) ceramics and metals
 - D) none
991. Which of the following is not co-polymer?
- A) Teflon
 - B) Buna-S
 - C) Nylon 6
 - D) Bakelite
992. Amorphous polymer don't have definite
- A) glass transition temperature
 - B) melting point
 - C) both a and b
 - D) none
993. The chemical composition of the rust is
- A) Fe₂O₃.H₂O
 - B) Fe₂O₃
 - C) Fe₃O₄.H₂O
 - D) Fe₂O₃.xH₂O
994. Brakish water can be purified by using
- A) lime-soda water
 - B) permuit process
 - C) boiling
 - D) reverse osmosis
995. Permanent hardness of water in water is due to presence of

- A) Calcium chloride
 - B) magnesium sulphate
 - C) both of
 - D) none of them
996. Which of the following can be used for the purity of substances?
- A) Gas chromatography
 - B) UV spectroscopy
 - C) IR spectroscopy
 - D) all
997. The IR spectrum of benzene will show strong band at
- A) 3000 cm⁻¹
 - B) 3300 cm⁻¹
 - C) 1500 cm⁻¹
 - D) 1700 cm⁻¹
998. When the photon emission occurs between states of the different energy states (T₁-S₀) the process called?
- A) Phosphorescence
 - B) fluorescence
 - C) inversion
 - D) none
999. The enriched uranium-235 used as nuclear fuel has the percentage of
- A) 3-5%
 - B) 1%
 - C) 2-3%
 - D) none
1000. Which one of these is straight fertilizer?
- A) Urea
 - B) DAP
 - C) CAN
 - D) All of these

ANSWER KEY

1.	B
2.	B
3.	B
4.	A
5.	A
6.	A
7.	C
8.	D
9.	A
10.	B
11.	B
12.	A
13.	B
14.	B
15.	A
16.	D
17.	A
18.	A
19.	A
20.	B
21.	A
22.	B
23.	A
24.	C
25.	D
26.	B

27.	A
28.	A
29.	B
30.	B
31.	B
32.	D
33.	C
34.	B
35.	C
36.	B
37.	C
38.	D
39.	C
40.	B
41.	B
42.	A
43.	B
44.	A
45.	C
46.	C
47.	B
48.	B
49.	C
50.	D
51.	A
52.	B

53.	A
54.	D
55.	A
56.	A
57.	A
58.	A
59.	A
60.	C
61.	C
62.	A
63.	A
64.	D
65.	A
66.	B
67.	B
68.	C
69.	A
70.	B
71.	A
72.	B
73.	C
74.	C
75.	C
76.	A
77.	A
78.	C

79.	A
80.	C
81.	C
82.	A
83.	A
84.	B
85.	B
86.	B
87.	B
88.	B
89.	B
90.	A
91.	A
92.	C
93.	D
94.	A
95.	C
96.	A
97.	C
98.	C
99.	C
100.	B
101.	B
102.	C
103.	B
104.	C
105.	C

106.	C
107.	B
108.	D
109.	D
110.	D
111.	C
112.	D
113.	C
114.	A
115.	B
116.	C
117.	B
118.	A
119.	C
120.	A
121.	A
122.	A
123.	D
124.	C
125.	A
126.	D
127.	D
128.	D
129.	C
130.	B
131.	A
132.	B
133.	D
134.	A
135.	D
136.	B
137.	B

138.	D
139.	C
140.	D
141.	C
142.	C
143.	D
144.	D
145.	D
146.	B
147.	C
148.	C
149.	C
150.	A
151.	B
152.	A
153.	D
154.	B
155.	C
156.	D
157.	D
158.	B
159.	A
160.	A
161.	D
162.	D
163.	B
164.	B
165.	C
166.	D
167.	B
168.	B
169.	B

170.	B
171.	A
172.	C
173.	B
174.	C
175.	C
176.	D
177.	A
178.	A
179.	C
180.	A
181.	A
182.	C
183.	A
184.	C
185.	B
186.	D
187.	D
188.	C
189.	C
190.	B
191.	D
192.	C
193.	D
194.	A
195.	A
196.	B
197.	B
198.	A
199.	A
200.	B
201.	C

202.	B
203.	B
204.	D
205.	A
206.	A
207.	A
208.	B
209.	B
210.	B
211.	C
212.	C
213.	A
214.	C
215.	A
216.	C
217.	A
218.	B
219.	D
220.	B
221.	A
222.	C
223.	B
224.	D
225.	C
226.	A
227.	D
228.	D
229.	B
230.	B
231.	A
232.	C
233.	B

234.	C
235.	B
236.	B
237.	A
238.	C
239.	B
240.	C
241.	D
242.	A
243.	B
244.	A
245.	A
246.	B
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