SRM Institute of Science and Technology, Delhi-NCR campus, Modinagar
B. Tech. First Year, MCQ Question Bank
Chemistry, 18CYB101J

1. Molecular orbitals are filled not according to
   A. Aufbau Principle
   B. Pauli Exclusion Principle
   C. Hund's rule
   D. Huckel's rule

ANSWER: D

2. The donor atom of a ligand in coordination chemistry is
   A. Lewis acid
   B. a counter ion
   C. central metal ion
   D. ligand atom that shares e- pair with metal

ANSWER:D

3. Does a linear molecule show aromaticity?
   A. may show
   B. may not show
   C. both a and b
   D. can not show

ANSWER: D

4. The wave function is a linear combination of
   A. Vectors
   B. Eigen values
   C. Eigen Functions
   D. Operators

ANSWER:C

5. Antibonding molecular orbitals are formed by …… of atomic orbitals.
   A. constructive interference
   B. destructive interference
   C. overlapping of atomic orbitals with two negative signs
   D. hybridization

ANSWER:B

6. For a particle in one dimensional box, potential energy V =_____inside the box.
   A. -1
   B. ∞
   C. 0
   D. 1

ANSWER: C

7. The normalization constant for a particle in one-dimensional box is

A. A
B. 2/a
C. a/2
D. √ (2/a)

ANSWER:D

8. The points inside the box where ψ=0 are called

A. Antinodes
B. nodes
C. radial points
D. angular points

ANSWER: B

9. Energy of electron in the n th orbit of H- atom is proportional to

A. square root of n
B. inverse square root of n
C. cube root of n
D. n

ANSWER: B

10. The probability of finding a particle per unit volume is known as

A. particle density
B. probability density
C. normalization
D. orthogonalization

ANSWER:B

11. The wave function Ψ describes

A. Intensity
B. energy density
C. state of the system
D. probability

ANSWER: C

12. For a particle in one-dimensional box, the number of nodes (N) and quantum number are related as

A. N = n
B. N = n-1
C. N = 2n
D. N = n+1

ANSWER:B

13. The maximum probability of finding the electron for the ground state hydrogen atom is found to be at

A. 0.0529 nm
B. 0.00529 nm
C. 0.529 nm
D. 0.158 nm

ANSWER: A

14. The carbon of aromatic benzene molecule is

A. sp3d2 hybridized
B. sp hybridized
C. sp2 hybridized
D. sp3 hybridized

ANSWER:C

15. Aromatic compounds do not have

A. planar structure
B. 4n π-electrons in structure
C. cyclic structure
D. 4n+2 π-electrons in structure

ANSWER: B

16. Benzene is a ……. structure of two Kekule's structure

A. hybrid
B. meso
C. monoclinic
D. isomeric

ANSWER: A

17. X-ray photoelectron spectroscopy is also known as

A. EPS
B. ECS
C. ESCA
D. EAS

ANSWER:C

18. Which energy is responsible to release the electron in XPS?

A. rotational energy
B. gibbs energy
C. binding energy
D. free energy

ANSWER:C

19. In XPS, the photon ejects electrons from which orbital?

A. 1s electron
B. 3s electron
C. 2s electron
D. 2p electron

ANSWER: A

20. In Bragg's equation [$n\lambda = 2.d.\sin\theta$], d is the:
A. interplanar spacing
B. inter spacing
C. planar spacing
D. extraplanar spacing

ANSWER:A

21. Which bond is weaker?
A. van der Waals bond
B. sigma bond
C. coordination bond
D. Ionic bond

ANSWER: A

22. Particles those are responsible for most of the properties
A. Nucleons
B. Protons
C. Shell electrons
D. Valence shell electrons

ANSWER: D

23. Which is correct?
A. $d \sin\theta = n\lambda$
B. $d = n\lambda\sin\theta$
C. $d = n\lambda\sin\theta$
D. $2d \sin\theta = n\lambda$

ANSWER: D

24. Which of the following elements has completely filled two shells?
A. Ni
B. Ne
C. Na
D. No

ANSWER: B

25. Electronic configuration 2,8 is related to
A. Al+
B. Al+2

C. Al+3
D. Al+4
ANSWER: C

26. Periodic table gives a platform for studying
A. physical properties only
B. chemical properties only
C. not any property
D. physical and chemical properties both
ANSWER: D

29. The nature of bond between two dissimilar atoms having different charges
A. polar only
B. non-polar only
C. polar and non-polar both
D. neutral
ANSWER: A

30. The geometry of [PtCl4]2- is
A. tetrahedral
B. octahedral
C. square planar
D. pyramidal
ANSWER: C

31. Miller indices is indicated by
A. (hkl)
B. (h,k,l)
C. [h,k,l]
D. {h,k,l}
ANSWER: A

32. Stereoisomerism is the study of ……. of the molecules
A. 3D orientation
B. 2D orientation
C. 1D orientation
D. No orientation
ANSWER: A

33. The isomers which are having same molecular formula but different configurations are called as
A. Structural isomers
B. Stereoisomers
C. positional isomers

D. tautomers
ANSWER: B

34. Geometric isomers are different from
A. Enantiomer
B. diastereomer
C. Both
D. non-mirror images
ANSWER: A

35. Enantiomerare not
A. Mirror image only
B. achiral
C. superimposable mirror images
D. non-specific images
ANSWER:C

36.Joule/Kelvin is unit of
A. energy
B. entropy
C. emf
D. power
ANSWER: B

37. …….. is a measure of randomness of a system.
A. entropy
B. internal energy
C. heat flow
D. enthalpy
ANSWER: A

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

39. The correct equation is-
A. $\Delta G = nF/E$
B. $\Delta G = n/FE$
C. $\Delta G = - nFE$
D. $\Delta G = F/nE$
ANSWER: C

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

41. Wet corrosion takes place on
A. anode
B. cathode
C. near cathode
D. near anode
ANSWER: A

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

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

44. The rate of dry corrosion is …….. than wet corrosion
A. lower
B. faster
C. average
D. moderate
ANSWER:A

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

46. Total energy of a system remains constant according to

A. first law of thermodynamics
B. second law of thermodynamics
C. third law of thermodynamics
D. newton's law
ANSWER: A

47. E = Eo – [(2.303RT)/nF] log10 [H+] is the formula of ……
A. Nernst equation
B. Newton equation
C. Gibbs equation
D. Free energy equation
ANSWER:A

48. Which is used to differentiate d- and l-isomers?
A. heat
B. temperature
C. polarized light
D. pressure
ANSWER: C

49. An equal proportion of two enantiomers is called as a _____
A. cis/trans mixture
B. mirror image
C. constitutional mixture
D. racemic mixture
ANSWER: D

50. Which cyclic compound feels highest ring strain
A. Cyclomethane
B. Cyclopropane
C. Cyclohexane
D. Cyclopentane
ANSWER:B

51. Which of the following is used in the sulphonation of benzene?
A. sulphuric acid
B. nitric acid
C. phosphoric acid
D. acetic acid
ANSWER: A

52. Antipyretics are used to
A. reduce body temperature
B. reduce vomiting

C. reduce nausea
D. increase body temperature

ANSWER: A

53. Analgesics are used to
A. reduce pain
B. reduce nausea
C. increase ache
D. increase pain

ANSWER:A

54. Which statement about aspirin is false.
A. Aspirin belongs to narcotic analgesics.
B. It is effective in relieving pain.
C. It has antiblood clotting action.
D. It is a neurologically active drug.

ANSWER: A

55. Which is most reactive species?
A. free radical
B. nucleophile
C. electrophile
D. cation

ANSWER:

56. Which is electron deficient species?
A. free radical
B. nucleophile
C. electrophile
D. anion

ANSWER: A

57. The name of OH- ligand is
A. Hydroxy
B. hydroxide
C. hydroxo
D. hydroxyl

ANSWER: C

58. Isocyano is the name of ……. Ligand
A. CN^-
B. NC^-
C. NCS^-
D. SCN^-

ANSWER: B

59. If the sign of wave function remains unaffected upon reflecting an orbital about its centre, the orbital is known as _____

A. Gerade
B. Ungerade
C. Gerade as well as Ungerade
D. Centralized

ANSWER: A

60. Molecular orbitals are being filled as per the _____

A. The Aufbau Principle
B. Pauli Exclusion Principle
C. Hund's rule of maximum multiplicity
D. All of the mentioned

ANSWER: D

61. The correct option as per the MOT

A. The bond order of O2 is 2.5 and it is paramagnetic
B. The bond order of O2 is 1.5 and it is paramagnetic
C. The bond order of O2 is 2 and it is diamagnetic
D. The bond order of O2 is 2 and it is paramagnetic

ANSWER: D

62. Which one is incorrect from the following options.

A. Electron density is low in the region between the nuclei of bonded atoms in case of bonding MO.
B. Antibonding MO is higher in energy than atomic orbitals from which it is formed
C. Every electron in bonding MO contributes toward stability of the molecule
D. Antibonding takes place when lobes of atomic orbitals have different signs

ANSWER: A

63. Which of the following properties is most likely to be retained during the process of corrosion?

A. Malleability
B. Ductility
C. Conductivity
D. Colour

ANSWER: D

64. The reason for conductivity of electrolytic conductors is _____

A. Flow of free mobile electrons
B. Movement of ions
C. Either movement of electrons or ions

D. Cannot be said

ANSWER: B

65. Which corrosion product is volatile in nature _____.

A. Fe2O3
B. MoO3
C. Fe3O4
D. FeOANSWER :B

66. The area in which electrochemical corrosion takes place is

A. Anodic area
B. Cathodic area
C. Near cathode
D. Near anode

ANSWER: A

67. In anodic reaction of corrosion metal is dissolved by releasing _____.

A. Pair of electron
B. Free electron
C. Ions
D. Current in electrolytic solution.

ANSWER: B

68. The green film of formed on the surface during corrosion of Cu contains CuCO3 and _____.

A. BaCO3
B. Ba(OH)2
C. Cu(OH)2
D. CuO

ANSWER: C

69. What is the value of average kinetic energy per molecule _____.

A. (3/2)kT
B. (3/2) RT
C. (½)kT
D. (1/2) RT

ANSWER: A

70. Which one has the highest value of first ionisation energy _____.

A. Hydrogen
B. Helium
C. Lithium
D. Sodium

ANSWER: B

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

72. Choose the correct option regarding the formation of a chemical bond _____.
    A. Energy is always absorbed
    B. Energy in always released
    C. More energy is released than is absorbed
    D. Energy is neither released nor absorbed
ANSWER: B

73. Electrons residing in the same orbital will have _____.
    A. Same spin
    B. Opposite spin
    C. Same or opposite spin
    D. No spin
ANSWER: B

74. The reason for greater strength of diamond as compared to graphite is _____.
    A. Difference in layers of atoms
    B. Tetrahedral structure of diamond
    C. Difference of crystalline structures
    D. Lusture of diamond
ANSWER: B

75. Polythene is industrially manufactured from _____.
    A. Methane
    B. Styrene
    C. Acetylene
    D. Ethylene
ANSWER: D

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

77. The correct statement about the atomic of the alkaline earth metals is _____.

A. it is smaller than corresponding alkali metals in the same periods
B. it is larger than corresponding alkali metals in the same periods
C. It is same as the corresponding alkali metals in the same periods
D. None of the above

ANSWER: A

78. The general electronic configuration of outermost orbital in the elements of Group 13 is _____.

A. ns2 np2
B. ns2
C. ns2 np1
D. ns2 np3

ANSWER: C

79. The correct statement about the variation of electronegativity in a group of the periodic table

A. It increases
B. It decreases
C. It remains constant
D. All of the above

ANSWER: B

80. The correct reason for the increase in the electronegativity across a period in periodic table

A. attraction between the valence electrons and the nucleus increases
B. attraction between the valence electrons and the nucleus decreases
C. increase in the atomic weight
D. decrease in the atomic weight

ANSWER: A

81. The correct statement about cell potential is _____.

A. sum of the electrode potentials of the cathode and anode
B. difference between the electrode potentials of the cathode and anode
C. half of the sum of the electrode potentials of the cathode and anode
D. twice the difference between the electrode potentials of the cathode and anode

ANSWER: B

82. The correct statement about methane is _____.

1. The largest reservoir of methane on earth is under the permafrost at arctic and Antarctic
2. Methane has a tetrahedral structure and also known as Hydrogen Carbide
3. Methane can be produced by Serpentinite method

Select the correct option from codes given below:

A. Only 1 & 2
B. Only 1 & 3

C. Only 2 & 3
D. 1, 2 & 3

ANSWER: C

83. What is the reason for variable valency of tranition metals
A. Release of electrons from ns orbitals
B. Release of electrons from np orbitals
C. Release of electrons from (n-1)d orbitals
D. Release of electrons from (n-1)d& ns orbitals

ANSWER: C

84. The enthalpy change in an exothermic reaction is shown with
A. negative values
B. positive values
C. neutral
D. constant

ANSWER: A

85. The incorrect statement about entropy is
A. S(monoclinic) > S(rhombic)
B. C(diamond) > C(graphite)
C. H2O(g) > H2O(l)
D. O3(g) > O2(g)

ANSWER: B

86. The Gibbs free energy change in a spontaneous process is equal to the
A. heat content of the system
B. entropy change of the system
C. work of expansion
D. useful work

ANSWER: D

87. Which of the following is a state function?
A. q
B. w
C. q_{rev}/T
D. qw

ANSWER: C

88. The concept of matter wave was suggested by
A. Heisenberg
B. Schrodinger
C. De Broglie
D. Niels Bhor

ANSWER: C

89. The operator ∇^2 is called operator
    A. Hamiltonian
    B. Poisson
    C. Laplacian
    D. Vector

ANSWER: A

90. The shape of s-orbital?
    A. Sphere
    B. Dumbbell
    C. Pear-shaped lobe
    D. Conical
    ANSWER: A

91. Developing year of Valence Bond Theory was?
    A. 1925
    B. 1927
    C. 1929
    D. 1932
    ANSWER: B

92. The Valence Bond Theory was developed by?
    A. Heitler and London.
    B. Bhor
    C. Linus Pauling
    D. Pauli
    ANSWER: C

93. The s-orbital does not show preference to any direction because _____
    A. It is the smallest orbital
    B. It is present in every atom
    C. It is spherically symmetric
    D. It is the first orbital
    ANSWER: C

94. Schrodinger equation in shorter form is given by $H\Psi=$
    A. EH
    B. E
    C. $E\Psi$
    D. G
    ANSWER: C

95. Which of the following molecule is not homonuclear?
A. H_2
B. N_2
C. CO
D. O_2
ANSWER: C

96. Which of the following molecule is homonuclear?
A. HF
B. NO_2
C. NO
D. O_2
ANSWER: D

97. The shape of a p orbital is?
A. Sphere
B. Dumbbell
C. Pear-shaped lobe
D. Cuboid
ANSWER: B

98. The interaction between a pair of orbitals of the same type is _____
A. Attractive
B. Repulsive
C. There is no interaction
D. None of the mentioned
ANSWER: B

99. Potential energy of a particle outside the box is
A. 1
B. Infinity
C. Zero
D. Finite
ANSWER: A

100. The most stable free radical among the following is
A. $C_6H_5CH_2CH_2$
B. $C_6H_5CHCH_3$
C. CH_3CH_2
D. CH_3CHCH_3
ANSWER: B

101. Geometrical Isomerism is shown by
A. CH_2=C(Br)I

B. $CH_3CH=C(Br)I$
C. $(CH_3)_2C=C(Cl)Br$
D. $CH_3CH=CCl_2$

ANSWER: B

102.Which of the following outer electronic configurations is characteristic of alkali metals

A. ns^1
B. ns^2
C. ns^2np^6
D. ns^2np^2

ANSWER: A

103. Group 2 elements are

A. oxidizing agents
B. reducing agents
C. oxidizing as well reducing agents
D. microbial agents

ANSWER: A

105.Paramagnetism is common in

A. p- block elements
B. d- block elements
C. s- block elements
D. f- block elements

ANSWER: B

106. d- block elements form coloured ions because

A. They absorb some energy for d – s transition
B. They absorb some energy for p – d transition
C. They absorb some energy for d – d transition
D. They do not absorb any energy

ANSWER: C

107. Which of the following elements involves gradual filling of 5f level

A. Lanthanides
B. Actinides
C. Transition metals
D. Coinage metals

ANSWER: B

108. $KMnO_4$ acts as an oxidizing agent in

A. Acidic medium only
B. Neutral and acidic medium
C. Neutral and alkaline medium
D. Neutral, acidic and alkaline medium

ANSWER: D

109. The hardness of water is measure by

A. EDTA method

B. Distillation method
C. Conductivity method
D. Viscosity method

ANSWER: A

110. What is the coordination number of the metal in $[Co\ (en)_2 Cl_2]^+$
A. 4
B. 5
C. 6
D. 3

ANSWER: C

111. Which of the following has square planar structure
A. $[NiCl_4]^{2-}$
B. $[Ni(CO)_4]$
C. $[Ni(CN)_4]^{2-}$
D. $MnCl_2$

ANSWER: C

112. The drugs used to get relief from pain are called
A. Antipyretics
B. Analgesics
C. Antibiotics
D. Antiseptics

ANSWER: B

113. The chemical extracted from the plant Rauwolfia serpentine is
A. Aspirin
B. Quinine
C. Bithional
D. Reserpine

ANSWER: D

114. The de Broglie equation applies to
A. Electrons only
B. Protons only
C. Neutrons only
D. All the material objects in motion

ANSWER: C

115. The number of nodal planes in a p_x orbital is
A. One
B. Two
C. Three
D. Zero

ANSWER: A

116.As compared to bonding MO, the antibonding MO has

A. Higher energy
B. Lower energy
C. Equal energy
D. Unpredictable value of energy

ANSWER: A

117.Out of the given vibrational modes which one does not belong to IR spectroscopy?

A. Stretching
B. Scissoring
C. Rocking
D. Rolling

ANSWER: D

118. Select the device used to separate the radiation of specific wavelength from wavelength of a continuous spectra?

A. Monochromator
B. Radiation source
C. Recorder
D. Processor

ANSWER: A

119. According to Beer's Law

A. absorbance is proportional to both the path length and concentration of the absorbing species
B. absorbance is proportional to the log of the concentration of the absorbing species
C. absorbance is equal to P0 / P
D. absorbance is equal to transmittance

ANSWER: A

120.Fine lines observed in atomic absorption spectra along with narrow brand with peaks are produced by

A. Electronic transition only
B. Vibrational transitions only
C. Rotational transitions only
D. Ro-vibrational transitions only

ANSWER: A

121. Which is incorrect about aromaticity?

A. It must be planar
B. It must be conjugated
C. Cyclic delocalization takes place
D. It must not obey Huckel’s rule

ANSWER: D

122. Carbon monoxide has a ….. bond order

A. 3
B. 5
C. 1
D. 1/2

ANSWER: A

123. What is the bond order in H_2?

A. 3.0
B. 2.0
C. 1.5
D. 1.0

ANSWER: D

124. Which formula is correct for nuclear spins?

A. 2I
B. 2I-1
C. 2I+1
D. 4I

ANSWER: C

125. What is the wavelength of ultra-violet region?

A. 400 nm – 700 nm
B. 700 nm to 1000 nm
C. 400 nm to 1000 nm
D. 10 nm to 400 nm

ANSWER: D

126. Which one is correct?

A. Eel >Evib > Erot > E tr
B. E tr >Erot >Evib > Eel
C. Etr >Evib > Eel > E rot
D. Erot >Evib >Etr > E el

ANSWER: A

127. The nuclear magnetic resonance occurs in region of electromagnetic spectrum

A. Visible region
B. Radiowave region
C. Infrared region
D. UV region

ANSWER: B

128. Which of the region of IR spectra cannot be same for two compounds?

A. Functional group region
B. Fingerprint region
C. Low-frequency region
D. No specific region

ANSWER: B

129. Which of the following is not a type of bending molecular vibration?
A. Scissoring
B. Symmetric Stretching
C. Wagging
D. Rocking

ANSWER: B

130. Presence of a functional group in a compound is investigated by
A. Chromatography
B. IR spectroscopy
C. X-ray photoelectron spectroscopy
D. X-ray diffraction

ANSWER: B

131. Hydrogen bonding can be detected by
A. IR
B. UV
C. XPS
D. XRD

ANSWER: A

132. The absorption or emission of light can be analysed using _____
A. Potentiometry
B. Conductometry
C. Spectroscopy
D. Viscosity

ANSWER: C

133. The CFSE for a high-spin d4 octahedral complex is:
A. –0.6 Δoct
B. –0.8 Δoct
C. –0.4 Δoct
D. –0.2 Δoct

ANSWER: A

134. $[Cr(CN)_6]^{3-}$ will be …… in nature:
A. paramagnetic
B. diamagnetic

C. nonmagnetic
D. uniform
ANSWER: A

135. The magnetic moment for $[Cr(CN)_6]^{3-}$ is approximately:
A. 3.87 μB
B. 4.87 μB
C. 2.87 μB
D. 1.87 μB
ANSWER: A

136. Which is correct according to ligands in spectrochemical series:
A. I– < Cl– < H2O <en
B. I– < Cl– < H2O = en
C. I– = Cl– < H2O <en
D. I– < Cl– = H2O <en
ANSWER: A

137. The electron acceptor in coordination complex is
A. Metal ion
B. ligand
C. p-orbital
D. s-orbital
ANSWER: A

138. Which metal ion have d3 electronic configuration in the following complexes?
A. [Cr(NH3)6]3+
B. [Co(OH2)6]2+
C. [Fe(CN)6]3-
D. [Ni(OH2)6]2+
ANSWER: A

139. Which method is used in XRD?

A. Lawe method
B. Leue method
C. Liue method
D. Laue method
ANSWER: D

140. Which one is having largest atomic radii?
A. Oxygen
B. Nitrogen
C. Fluorine

D. Lithium
ANSWER: B

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

142. The purpose of the salt bridge in an electrochemical cell is to _____.
A. increase electrons
B. maintain electrical neutrality
C. decrease electrons
D. decrease electrical neutrality
ANSWER: B

143. As per the HSAB principle ionic bond is formed when
A. soft acid combines with hard bases
B. hard acid combines with soft bases
C. hard acid combines with hard bases
D. hydrogen combination with acid
ANSWER: C

144. The potential energy of n-butane is not maximum for _____.
A. Skew conformations
B. Staggered conformations
C. Eclipsed conformations
D. Gauche
ANSWER: B

145. Which of the following acts as catalysis in the nitration of benzene?
A. Conc. HCl
B. Conc. H2SO4
C. both A and B
D. H3PO4
ANSWER: B

146. The aldehydes give …….. on treated with Lithium aluminium hydride.
A. Alcohols
B. benzene
C. toluene
D. furan
ANSWER: A

147. The Dieckmann condensation reaction gives

A. Alkane
B. cyclic β-ketoesters
C. alocohol
D. acyclic β-ketoesters

ANSWER: B

148. Paracetamol is synthesized from

A. o-aminophenol and acetic anhydride
B. p-aminophenol and acetic anhydride
C. methyl amine and phenol
D. phenol and amine

ANSWER: B

149. Aspirin is chemically known as……

A. methyl salicylic acid
B. phenyl salicylic acid
C. acetylsalicylic acid
D. methanol

ANSWER: C

150. Bond angle in PCl_5 molecule are _____

A. 120^0 and 60^0
B. 120^0 and 90^0
C. 120^0 and 180^0
D. None of these

ANSWER: B

151. Shape of H_2O molecule is _____

A. Tigonal Planar
B. Linear
C. Angular or bent structure
D. Tetrahedral

ANSWER: C

152. The total probability of finding the electron in a orbital must be

A. Zero
B. One
C. Infinity
D. Double

ANSWER: B

153. Which one is the correct expression for uncertainty principle

A. $\Delta X.\Delta p \geq h/4\pi$
B. $\Delta X.\Delta p \geq h/2\pi$
C. $\Delta E.\Delta t \leq h/4\pi$
D. None of these

ANSWER: A

154. An atom has two unpaired electrons. The total spin of this atom will be

A. 0
B. 1
C. 1.5
D. 2

ANSWER: B

155. Energy expression of a particle in one dimensional box is

A. $n^2 h^2/4mL^2$
B. $n^2 h^2/6mL^2$
C. $n^2 h^2/8mL^2$
D. $n^2 h^2/mL^2$

ANSWER: C

156. From the following options, choose the heteronuclear diatomic molecules which are paramagnetic in nature?

A. HF and NO
B. HF and O_2
C. NO and O_2
D. Only NO

ANSWER: D

157. The bond order of O_2 molecule on the basis of molecular orbital theory …..

A. is 2 and it is paramagnetic
B. is 2.5 and it is paramagnetic
C. is 1.5 and it is paramagnetic
D. is 2 and it is diamagnetic

ANSWER: A

158. When $\psi(x) = \psi(-x)$ the function is

A. Symmetric
B. antisymmetric
C. sine
D. finite

ANSWER: A

159. Which complex ion will be having tetrahedral geometry?

A. $[PdCl_4]^{2-}$

B. $[PtCl_4]^{2-}$
C. $[NiCl_4]^{2-}$
D. $[AuCl_4]^{2-}$
ANSWER: C

160. $[Co(NH_3)_6]^{3+}$is
A. Diamagnetic
B. paramagnetic
C. non magnetic
D. comagnetic
ANSWER: A

161. Which dissolves in water according to Fajans rule?
A. silver fluoride
B. silver fluoride
C. silver bromide
D. silver iodide
ANSWER: A

162. Which of the following molecule have infrared active vibrations?
A. HCl
B. CH_4
C. H_2
D. N_2
ANSWER: A

163. Ketones gives …….. upon reduction.
A. 1^o alcohols
B. 2^o alcohols
C. 3^o alcohols
D. Alkenes
ANSWER: B

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

165. Which …….. nomenclature not used to differentiate enantiomers?
A. R/S
B. E/Z
C. +/–

D. D/L

ANSWER: B

166. Ion etching technique provides the …….. from the surface.

A. depth profiling
B. round profiling
C. vertical profiling
D. horizontal profiling

ANSWER:A

167. X-ray diffractometers can notanalyze ……..

A. Metals
B. Liquids
C. Polymers
D. Solids

ANSWER: B

168. XRD can be used to analyze the samples …..……..

A. quantitatively
B. qualitatively
C. quantitatively and qualitatively both
D. Either quantitatively or qualitatively

ANSWER: C

169. Which rays have larger wavelengths?

A. Gamma rays
B. Beta rays
C. Microwave
D. Visible light

ANSWER: A

170. The best class of drugs is based upon_____.

A. chemical structure.
B. drug action.
C. molecular targets.
D. pharmacological effect

ANSWER: C

171. Which is the example of elimination reaction?

A. Hydration
B. Dehydration
C. Halogenation
D. alkylation

ANSWER: B

172.$Fe_2O_3.xH_2O$is chemical formula for

A. iron catalyst
B. iron metal
C. hydroxyapatite
D. rust

ANSWER: D

173. Correct set of four quantum numbers for the valence (outermost) electron of Rubidium (Z=37) is:

A. 5, 0, 0, +½
B. 5, 1, 0, +½
C. 5, 1, 1, +½
D. 6, 0, 0, +½

ANSWER: A

174. Which hydrogen like species will have same radius as that of Bohr's first orbit of hydrogen atom?

A. n=2, Li2+
B. n=2, Be3+
C. n=2, He+
D. n=3, Li2+

ANSWER: B

175. The number of radial nodes of 3s and 2p orbitals are respectively :

A. 2, 0
B. 0, 2
C. 1, 2
D. 2, 11

ANSWER: B

176. Uncertainty in position of a particle of 25 g in space is 10-5 m. Hence, uncertainty in velocity (m s-1) is: (Planck's constant, h = 6.6 x 10-34 J s)

A. 2.1×10^{-28}
B. 2.1×10^{-34}
C. 0.5×10^{-34}
D. 5.0×10^{-24}

ANSWER: A

177. Which one of the following transitions of an electron in hydrogen atom emits radiation of the lowest wavelength?

A. n2=∞ to n1=2
B. n2=4 to n1=3
C. n2=2 to n1=1

D. n2=5 to n1=3
ANSWER: C

178. Which of the following is not an ambidentate ligand ?
A. CN-
B. SCN-
C. NH_3
D. NO_2
ANSWER: C

179. The compound of the formula CH3CO(CH2)5CH=CHñCOOH would be expected to
I: rotate the plane polarised light
II: contain chiral centre
III: Contain three stereocentres
IV: show geometrical isomerism
A. only I, II, III correct
B. only II, IV correct
C. I, II, III, IV correct
D. only IV correct
ANSWER: D

180. Which isomers are not separable from their mixture by any physical method of separation?

1. Enantiomers
2. Conformational isomers
3. Geometrical isomers
4. Functional isomers

A. only I and 2 correct
B. only IV
C. I, II, III, IV
D. only 2,3
ANSWER: D

181. The relative energies order of molecular orbitals in increasing order to be as follows.
$(\sigma_{1s}) < (\sigma^*_{1s}) < (\sigma_{2s}) < (\sigma^*_{2s}) < [(\pi_{2py})(\pi_{2pz})] < (\sigma_{2px}) < [(\pi^*_{2py})(\pi^*_{2pz})] < (\sigma^*_{2px})$
A. For O_2 to Ne_2
B. For H_2 to N_2
C. For H_2 to Ne_2
D. For N_2 to Ne_{2+}
ANSWER: B

182. Order of the following molecules in increasing stability is?

A. $N_2 < N_2^- < N_2^{2-}$
B. $N_2^{2-} < N_2^- < N_2^+$
C. $N_2^{2-} < N_2^- < N_2$
D. $N_2 < N_2^+ < N_2^{2-}$

ANSWER: C

183. Bond Order of O_2, N_2 are ……, respectively?

A. +1, +2
B. +2, +3
C. +2, +1
D. +3, +2

ANSWER: B

184. The combination of H ($1s^1$) and F ($2px^1$) gives _____

A. Bonding orbital
B. Antibonding orbital
C. Both bonding and antibonding orbital
D. P-orbital

ANSWER: C

185. Ground state energy of an electron in an infinite 1 dimensional box of width of 1A°?

A. 38 eV
B. 342 eV
C. 152 eV
D. 28eV

ANSWER: A