PHYSICS

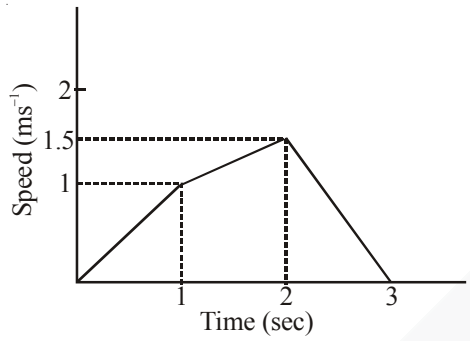
101. Which of the following principles is being used in Sonar Technology?
(1) Reflection of ultrasonic waves
(2) Newton's laws of motion
(3) Reflection of electromagnetic waves
(4) Laws of thermodynamics

Ans (1)

102. What is the dimension of surface tension?
(1) $[ML^1L^0]$ (2) $[ML^1L^{-1}]$
(3) $[ML^0L^{-2}]$ (4) $[M^1L^0T^{-2}]$

Ans (3, 4)

103. The speed-time graph of a particle moving along a solid curve is shown below. The distance traversed by the particle from $t = 0$ to $t = 3$ is



(1) $\frac{10}{2}$ sec (2) $\frac{10}{4}$ sec
(3) $\frac{10}{3}$ sec (4) $\frac{10}{5}$ sec

Ans (2) it should be 10/4 metre

104. Which of the following is correct relation between an arbitrary vector $\overline{A}$ and null vector $\overline{O}$?
(1) $\overline{A} + \overline{O} + \overline{A} \times \overline{O} = \overline{A}$ (2) $\overline{A} + \overline{O} + \overline{A} \times \overline{O} \neq \overline{A}$
(3) $\overline{A} + \overline{O} + \overline{A} \times \overline{O} = \overline{O}$ (4) None of these

Ans (1)

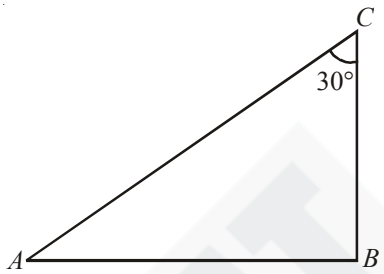
105. An object is being thrown at a speed of 20 m/s in a direction 45° above the horizontal. The time taken by the object to return to the same level is
(1) 20/g (2) 20g
(3) $20\sqrt{2}$ /g (4) $20\sqrt{2}$ g

Ans (3)

106. An object is moving on a plane surface with uniform velocity 10 ms^{-1} in presence of a force 10 N. The frictional force between the object and the surface is
(1) 1 N (2) –10 N
(3) 10 N (4) 100 N

Ans (2)

107. A body of mass M starts sliding down on the inclined plane where the critical angle is $\angle ACB = 30°$ as shown in figure. The coefficient of kinetic friction will



(1) Mg/$\sqrt{3}$ (2) $\sqrt{3}$ Mg
(3) $\sqrt{3}$ (4) None of these

Ans (3)

108. In non-inertial frame, the second law of motion is written as
(1) $F = ma$ (2) $F = ma + F_P$
(3) $F = ma - F_P$ (4) $F = 2ma$
where F_P is pseudo-force while a is the acceleration of the body relative to non-inertial frame

Ans (3)

109. The work done by an applied variable force $F = x + x^3$ from $x = 0$ m to $x = 2$ m, where x is displacement, is
(1) 6 J (2) 8 J
(3) 10 J (4) 12 J

Ans (1)

110. The coefficient of restitute, e, for a perfectly elastic collision is
(1) 0 (2) –1
(3) 1 (4) ∞

Ans (3)

111. A particle of mass m_1 moves with velocity ν_1 and collides with another particle at rest of equal mass. The velocity of the second particle after the elastic collision is
(1) $2\nu_1$ (2) ν_1
(3) $-\nu_1$ (4) 0

Ans (2)

112. The centre of mass of a solid cone along the line from the centre of the base to the vertex is at
(1) One-fourth of the height
(2) One-third of the height
(3) One fifth of the height
(4) None of these

Ans (1)

113. A solid cylinder is rolling without slipping on a plane having inclination θ and the coefficient of static friction μ_s. The relation between θ and μ_s is
(1) $\tan\theta > 3\,\mu_s$ (2) $\tan\theta \leq 3\,\mu_s$
(3) $\tan\theta > 3\,\mu_s^2$ (4) None of these

Ans (2)

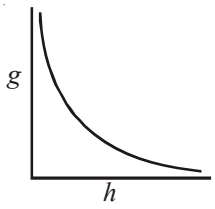
114. The reduced mass of two particles having masses m and $2m$ is

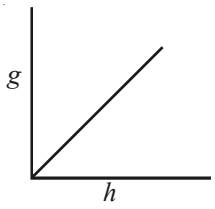
(1) 2m (2) 3m

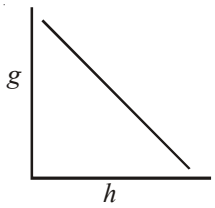
(3) 2m/3 (4) m/2

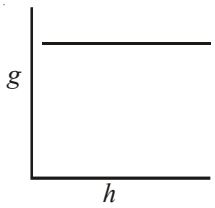
Ans (3)

115. Which of the following graphs shows the variation of acceleration due to gravity g with depth h from the surface of the earth?

(a) 

(b) 

(c) 

(d) 

(1) (a) (2) (b)

(3) (c) (4) (d)

Ans (3)

116. At what altitude (h) above the earth's surface would the acceleration due to gravity be one fourth of its value at the earth's surface?

(1) $h = R$ (2) $h = 4R$

(3) $h = 2R$ (4) $h = 16R$

where, R is the radius of the earth

Ans (1)

117. According to C.E. van der Waal, the interatomic potential varies with the average interatomic distance (R) as

(1) R^{-1} (2) R^{-2}

(3) R^{-4} (4) R^{-6}

Ans (4)

118. A sphere of radius 3 cm is subjected to a pressure of 100 atm. Its volume decreases by 0.3 cc. What will be its bulk modulus?

(1) $4\pi \times 10^5$ atm (2) $4\pi \times 103^4$ atm

(3) $4\pi \times 10^6$ atm (4) $4\pi \times 10^8$ atm

(Correct answer is $4\pi \times 3 \times 10^3$)

119. A vertical tank with depth H is full with water. A hole is made on one side of the walls at a depth h below the water surface. At what distance from the foot of the wall does the emerging stream of water strike the foot?

(1) $\sqrt{h(H-h)}$ (2) $\sqrt{h/(H-h)}$

(3) $2(H-h)\sqrt{h/(H-h)}$ (4) $\sqrt{2h/(H-h)}$

Ans (3)

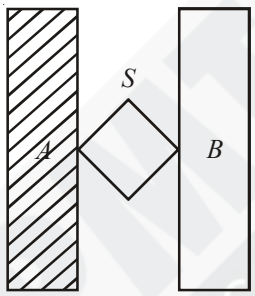
120. The mean free path of collision of gas molecules varies with its diameter (d) of the molecules as

(1) d^{-1} (2) d^{-2}

(3) d^{-3} (4) d^{-4}

Ans (2)

121. Consider two insulated chambers (A, B) of same volume connected by a closed knob, S. 1 mole of perfect gas is confined in chamber A. What is the change in entropy of gas when knob S is opened? $R = 8.31$ J mol^{-1}K^{-1}



(1) 1.46 J/K (2) 3.46 J/K

(3) 5.46 J/K (4) 7.46 J/K

Ans (3)

122. A Carnot engine has efficiency 25%. It operates between reservoirs of constant temperatures with temperature difference of 80°C. What is the temperature of the low-temperature reservoir?

(1) –25°C (2) 25°C

(3) –33°C (4) 33°C

Ans (3)

123. During the phenomenon of resonance

(1) The amplitude of oscillation becomes large

(2) The frequency of oscillation becomes large

(3) The time period of oscillation becomes large

(4) All of the above

Ans (1)

124. The longitudinal wave can be observed in

(1) Elastic media (2) Inelastic media

(3) Both of the above (4) None of these

Ans (1)

125. The two waves of the same frequency moving in the same direction given rise to

(1) Beats

(2) Interference

(3) Stationary waves

(4) None of these

Ans (4)

126. Domestic electrical wiring has three wires

(1) Positive, negative and neutral

(2) Positive, negative and earth

(3) Live, neutral and earth

(4) Positive, negative and live

Ans (3)

127. Which of the following is not true?
(1) For a point charge, the electrostatic potential varies as $1/r$
(2) For a dipole, the potential depends on the position vector and dipole moment vector
(3) The electric dipole potential varies as $1/r$ at large distance
(4) For a point charge, the electrostatic field varies as $1/r^2$

Ans (3)

128. The mobility of charge carriers increases with
(1) Increase in the average collision time
(2) Increase in the electric field
(3) Increase in the mass of the charge carriers
(4) Decrease in the charge of the mobile carriers

Ans (1)

129. When an AC voltage is applied to a LCR circuit, which of the following is true?
(1) I and V are out of phase with each other in R
(2) I and V are in phase L while in C, they are out of phase
(3) I and V are out of phase in both, C and L
(4) I and V are out of phase in L and in phase in C

Ans (3)

130. For a medium with permittivity ε and permeability μ, the velocity of light is given by
(1) $\sqrt{\frac{\mu}{\varepsilon}}$ (2) $\sqrt{\mu\varepsilon}$
(3) $\frac{1}{\sqrt{\mu\varepsilon}}$ (4) $\sqrt{\frac{\varepsilon}{\mu}}$

Ans (3)

131. In optical fibres, the refractive index of the core is
(1) Greater than that of the cladding
(2) Equal to that of the cladding
(3) Smaller than that of the cladding
(4) Independent of that of the cladding

Ans (1)

132. For a wavelength of light 'λ' and scattering object of size 'a', all wavelengths are scattered nearly equally, if
(1) $a = \lambda$ (2) $a >> \lambda$
(3) $a << \lambda$ (4) $a \geq \lambda$

Ans (2)

133. For a telescope having f_o as the focal length of the objective and f_e as the focal length of the eyepiece, the length of the telescope tube is
(1) f_e (2) $f_o - f_e$
(3) f_o (4) $f_o + f_e$

Ans (4)

134. If two sources have a randomly varying phase difference $\varphi(t)$, the resultant intensity will be given by
(1) $\frac{1}{2I_0}$ (2) $\frac{I_0}{2}$
(3) $2I_0$ (4) $\frac{I_0}{\sqrt{2}}$

Ans (3)

135. For an aperture of size 'a' illuminated by a parallel beam of light having wavelength λ, the Fresnel distance is
(1) $\approx \frac{a}{\lambda}$ (2) $\approx \frac{a^2}{\lambda}$
(3) $\approx a^2\lambda$ (4) $\approx \frac{a}{\lambda^2}$

Ans (2)

136. The maximum kinetic energy of the photoelectrons varies
(1) Inversely with the intensity and is independent of the frequency of the incident radiation
(2) Inversely with the frequency and is independent of the intensity of the incident radiation
(3) Linearly with the frequency and the intensity of the incident radiation
(4) Linearly with the frequency and is independent of the intensity of the incident radiation

Ans (4)

137. The work function for Al, K and Pt is 4.28 eV, 2.30 eV and 5.65 eV respectively. Their respective threshold frequencies would be
(1) Pt > Al > K
(2) Al > Pt > K
(3) K > Al > Pt
(4) Al > K > Pt

Ans (1)

138. When helium nuclei bombard beryllium nuclei, then
(1) Electrons are emitted
(2) Protons are emitted
(3) Neutrons are emitted
(4) Protons and neutrons are emitted

Ans (3)

139. When tow nuclei (with A = 8) join to form a heavier nucleus, the binding energy (B.E.) per nucleon of the heavier nuclei is
(1) More than the B.E. per nucleon of the light nuclei
(2) Same as the B.E. per nucleon of the light nuclei
(3) Less than the B.E. per nucleon of the light nuclei
(4) Double the B.E. per nucleon of the light nuclei

Ans (1)

140. In a reverse-biased *p-n* junction, when the applied bias voltage is equal to the breakdown voltage, then
(1) Current remains constant while voltage increases sharply
(2) voltage remains constant while current increases sharply
(3) Current and voltage increase
(4) Current and voltage decreases

Ans (2)

141. A charged cloud system produces an electric field in the air near the earth's surface. A particle of charge -2×10^{-9} C is acted on by a downward electrostatic force of 3×10^{-6} N when placed in this field. The gravitational and electrostatic force , respectively, exerted on a proton placed in this field are
(1) 1.64×10^{-26} N, 2.4×10^{-16} N
(2) 1.64×10^{-26} N, 1.5×10^{3} N
(3) 1.56×10^{-18} N, 2.4×10^{-16} N
(4) 1.5×10^{3} N, 2.4×10^{-16} N

Ans (1)

142. The frequency of oscillation of an electric dipole moment having dipole moment p and rotational inertia I, oscillating in a uniform electric field E is given by
(1) $\left(\frac{1}{2\pi}\right)\sqrt{\frac{I}{pE}}$ (2) $\left(\frac{1}{2\pi}\right)\sqrt{\frac{pE}{I}}$
(3) $(2\pi)\sqrt{\frac{pE}{I}}$ (4) $(2\pi)\sqrt{\frac{I}{pE}}$

Ans (2)

143. What is the net charge on a conducting sphere of radius 10 cm? Given that the electric field 15 cm from the center of the sphere is equal to 3×10^{3} N/C and is directed inward
(1) -7.5×10^{-5} C (2) -7.5×10^{-9} C
(3) 7.5×10^{-5} C (4) 7.5×10^{-9} C

Ans (2)

144. How many 1 μF capacitors must be connected in parallel to store a charge of 1 C with a potential of 110 V across the capacitors?
(1) 990 (2) 900
(3) 9090 (4) 909

Ans (3)

145. A 1250 W heater operates at 115 V. What is the resistance of the heating coil?
(1) 16 Ω (2) 13.5 Ω
(3) 1250 Ω (4) 10.6 Ω

Ans (4)

146. A proton traveling at 23° w.r.t. the direction of a magnetic field of strength 2.6 mT experiences a magnetic force of 6.5×10^{-17} N. What is the speed of the proton?
(1) 2×10^{5} m/sec (2) 4×10^{5} m/sec
(3) 6×10^{5} m/sec (4) 8×10^{5} m/sec

Ans (2)

147. What uniform magnetic field applied perpendicular to a beam of electrons moving at 1.3×10^{6} m/sec, is required to make the electrons travel in a circular arc of radius 0.35 m?
(1) 2.1×10^{-5} G (2) 6×10^{-5} T
(3) 2.1×10^{-5} T (4) 6×10^{-5} G

Ans (3)

148. A transformer has 500 primary turns and 10 secondary turns. If the secondary has a resistive load of 15 Ω, the currents in the primary and secondary respectively, are
(1) 0.16 A, 3.2×10^{-3} A (2) 3.2×10^{-3} A, 0.16 A
(3) 0.16 A, 0.16 A (4) 3.2×10^{-3} A, 3.2×10^{-3} A

Ans (2)

149. For a radio signal to travel 150 km from the transmitter to a receiving antenna, it takes
(1) 5×10^{-4} sec (2) 4.5×10^{-3} sec
(3) 5×10^{-8} sec (4) 4.5×10^{-6} sec

Ans (1)

150. In Young's double-slit experiment, if the distance between the slits is halved and the distance between the slits and the screen in doubled, the fringe width becomes
(1) Half (2) Double
(3) Four times (4) Eight times

Ans (3)

CHEMISTRY

151. In the given structure of a compound, the correct various bond moments direction involving are shown as
(1) Br $\leftarrow$ N $\leftarrow$ CH_2 $\rightarrow$ SiH_2 $\leftarrow$ CH_2 $\rightarrow$ O $\leftarrow$ CH_3
(2) Br $\leftarrow$ N $\leftarrow$ CH_2 $\leftarrow$ SiH_2 $\leftarrow$ CH_2 $\rightarrow$ O $\leftarrow$ CH_3
(3) Br $\leftarrow$ N $\rightarrow$ CH_2 $\leftarrow$ SiH_2 $\rightarrow$ CH_2 $\rightarrow$ O $\leftarrow$ CH_3
(4) Br $\leftarrow$ N $\rightarrow$ CH_2 $\rightarrow$ SiH_2 $\leftarrow$ CH_2 $\rightarrow$ O $\rightarrow$ CH_3

Ans. (3)

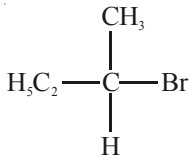
152. For the given alkane

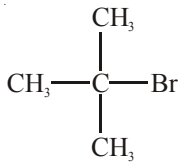
The IUPAC name is

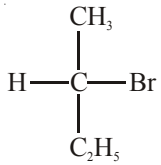
(1) 1,1-dimethyl-5-ethyl octane
(2) 6-ethyl-2-methyl nonane
(3) 4-ethyl-8-methyl nonane
(4) 2-methyl,-6-propyl octane

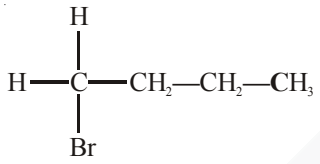
Ans. (2)

153. Which will undergo S_N2 substitution reaction when treated with NaOH?

(1) 

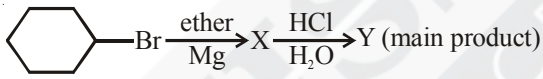
(2) 

(3) 

(4) 

Ans. (4)

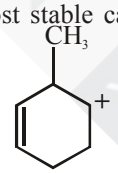
154. Given reaction

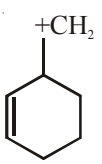


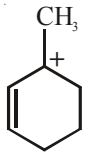
'Y' in the reaction is
(1) Hexane
(2) Cyclohexane
(3) Cyclohexylcyechlohexane
(4) Cyclohexylether

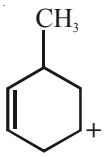
Ans. (2)

155. Most stable carbocation is

(1) 

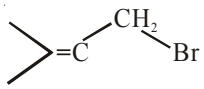
(2) 

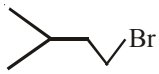
(3) 

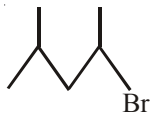
(4) 

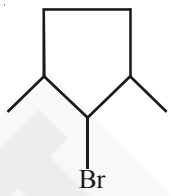
Ans. (3)

156. Which one of the following alkylbromides undergoes most rapid solvolysis in methanol solution to give corresponding methyl ether?

(1) 

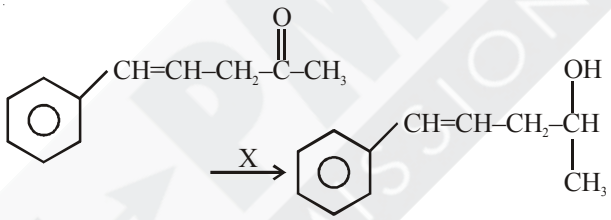
(2) 

(3) 

(4) 

Ans. (1)

157. In the conversion of



'X' is
(1) H_2/Pt
(2) Zn-Hg/HCl
(3) Li/NH_3
(4) $NaBH_4$

Ans. (4)

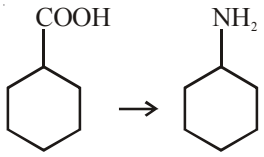
158. Which is not the correct statement about RNA and DNA?
(1) DNA is active in virus where RNA never appears in virus
(2) DNA exists as dimer while RNA is usually single stranded
(3) DNA contains deoxyribose as its sugar and RNA contains ribose
(4) RNA contains uracil in place of thymine (found in DNA) as a base

Ans. (1)

159 What is nature of glucose-glucose linkage in starch that makes its so susceptible to acid hydrolysis?
(1) Starch is hemiacetal
(2) Starch is acetal
(3) Starch is polymer
(4) Starch contains only few molecules of glucose

Ans. (2)

160. In the conversion



The sequence of the reagents used are
(1) (*i*) $SOCl_2$ (*ii*) N_3^- (*iii*) H_2O, heat
(2) (*i*) $SOCl_2$ (*ii*) NH_3
(3) (*i*) $SOCl_2$ (*ii*) NH_3 (*iii*) Heat
(4) (*i*) $SOCl_2$ (*ii*) KCN (*iii*) $LiAlH_4$

Ans. (1)

161. In the reaction

$$2H_2O_2 \longrightarrow 2H_2O + O_2$$

(1) Oxygen is oxidised only
(2) Oxygen is reduced only
(3) Oxygen is neither oxidised nor reduced
(4) Oxygen is both oxidised and reduced

Ans. (4)

162. Which of the following is not acid-base conjugate pair?
(1) HONO, NO_2^-
(2) $CH_3NH_3^+$, CH_3NH_2
(3) C_6H_5–COOH, $C_6H_5COO^-$
(4) H_3O^+, OH^-

Ans. (4)

163. Which one of the following has the strongest O–O bond?
(1) O_2^+ (2) O_2^0
(3) O_2^- (4) O_2^{2-}

Ans. (1)

164. For the reactions

$I_2(aq) \rightleftharpoons I_2(oil)$ Equilibrium constant is K_1

$I_2(oil) \rightleftharpoons I_2(ether)$ Equilibrium constant is K_2

For the reaction

$I_2(aq) \rightleftharpoons I_2(ether)$ Equilibrium constant is K_3

The relation between K_1, K_2, K_3 is
(1) $K_3 = K_1 + K_2$ (2) $K_3 = K_1 K_2$
(3) $K_3 = K_1 / K_2$ (4) $K_3 = K_2 / K_1$

Ans. (2)

165. The geometry of electron pairs around I in IF_5 is
(1) Octahedral (2) Trigonal bipyramidal
(3) Square pyramidal (4) Pentagonal planar

Ans. (1)

166. Which statement is not correct?
(1) Rate of an exothermic reaction increases with temperature
(2) Solubility of NaOH increases with temperature
(3) K_P for $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ increases with increase in pressure
(4) For gaseous reaction $2B \rightarrow A$ K_P is smaller than K_C

Ans. (3)

167. Which change requires an oxidising agent?
(1) $2S_2O_3^{2-} \rightleftharpoons S_4O_6^{2-}$ (2) $Zn^{2+} \rightleftharpoons Zn$
(3) $ClO^- \rightleftharpoons Cl^-$ (4) $SO_3 \rightleftharpoons SO_4^{2-}$

Ans. (1)

168. Given the following reactions involving, A, B, C and D
(i) $C + B^+ \rightarrow C^+ + B$
(ii) $A^+ + D \rightarrow$ No reaction
(iii) $C^+ + A \rightarrow$ No reaction
(iv) $D + B^+ \rightarrow D^+ + B$

The correct arrangement of A, B, C, D in order of their decreasing ability as reducing agent
(1) D > B > C > A (2) A > C > D > B
(3) C > A > B > D (4) C > A > D > B

Ans. (4)

169. Which ion has the largest radius?
(1) Se^{2-} (2) F^-
(3) O^{2-} (4) Rb^+

Ans. (1)

170. Which is correct statement about $Cr_2O_7^{2-}$ structure?
(1) It has neither Cr–Cr bonds nor O–O bonds
(2) It has one Cr–Cr bond and six O–O bonds
(3) It has no Cr–Cr bond and has six O–O bonds
(4) It has one Cr–Cr bond and seven Cr–O bonds

Ans. (1)

171. Which reaction, with the following values of ΔH, ΔS at 400 K is spontaneous and endothermic?
(1) ΔH = –48 kJ; ΔS = + 135 J/K
(2) ΔH = –48 kJ; ΔS = – 135 J/K
(3) ΔH = +48 kJ; ΔS = + 135 J/K
(4) ΔH = +48 kJ; ΔS = – 135 J/K

Ans. (3)

172. The correct decreasing order of dipolement in CH_3Cl, CH_3Br and CH_3F is
(1) $CH_3F > CH_3Cl > CH_3Br$
(2) $CH_3F > CH_3Br > CH_3Cl$
(3) $CH_3Cl > CH_3F > CH_3Br$
(4) $CH_3Cl > CH_3Br > CH_3F$

Ans. (3)

173. Given exothermic reaction

$CoCl_4^{2-}(aq) + 6H_2O(l) \rightleftharpoons [Co(H_2O)_6]^{2+} + 4Cl^-$

Which one of the following will decrease the equilibrium concentration of $CoCl_4^{2-}$?
(1) Addition of HCl
(2) Addition of $Co(NO_3)_2$
(3) The solution in diluted with water
(4) The temperature is increased

Ans. (3)

174. Hydrogen is prepared from H_2O by adding
(1) Ca, which act as reducing agent
(2) Al, which acts as oxidising agent
(3) Ag, which acts as reducing agent
(4) Au, which acts as oxidising agent

Ans. (1)

175. For preparing a buffer solution of pH = 7.0, which buffer system you will choose?
(1) H_3PO_4, $H_2PO_4^-$ (2) $H_2PO_4^-$, HPO_4^{2-}
(3) HPO_4^{2-}, PO_4^{3-} (4) H_3PO_4, PO_4^{3-}

Ans. (2)

176. Which element undergoes disproportionation in water?
(1) Cl_2 (2) F_2
(3) K (4) Cs
Ans. (1)

177. Which one of the following species acts only as a base?
(1) H_2S (2) HS^-
(3) S^{2-} (4) H_2O
Ans. (3)

178. For the following reaction
$C_6H_{12}O_6(aq) + H_2(g) \rightleftharpoons C_6H_{14}O_6(aq)$
Which one of the following is not affected by the addition of catalyst?
(1) Rate of forward reaction
(2) Rate of backward reaction
(3) Time required to reach the equilibrium
(4) Spontaneity
Ans. (4)

179. Which is not the correct statement?
(1) The S_8 ring is not planar
(2) Oxygen is more electronegative than sulphur
(3) SF_4 exists, but OF_4 does not exist
(4) SO_3 and SO_3^{2-} both have trigonal planar geometry
Ans. (4)

180. Which can exist both as diastereoisomer and enantiomer?
(1) $[Pt(en)_3]^{4+}$ (2) $[Pt(en)_2ClBr]^{2+}$
(3) $[Ru(NH_3)_4)Cl_2]^0$ (4) $[PtCl_2Br_2]^0$
Ans. (2)

181. Number of isomeric forms (constitutional and stereoisomers) for $[Rh(en)_2(NO_2)SCN)]^+$ are
(1) Three (2) Six
(3) Nine (4) Twelve
Ans. (4)

182. For transition metal octahedral complexes, the choice between high spin and low spin electronic configurations arises only for
(1) d^1 to d^3 complexes (2) d^4 to d^7 complexes
(3) d^7 to d^9 complexes (4) d^1, d^2 and d^8 complexes
Ans. (2)

183. For a chemical reaction of the type
$A \rightleftharpoons B$, K = 2.0 and $B \rightleftharpoons C$, K = 0.01
Equilibrium constant for the reaction $2C \rightleftharpoons 2A$ is
(1) 25 (2) 50
(3) 2500 (4) 4×10^{-4}
Ans. (3)

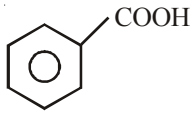
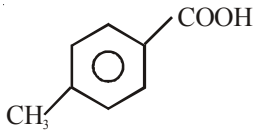
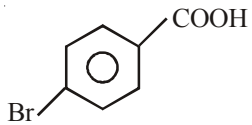
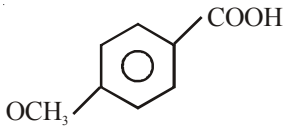
184. A chemical reaction proceeds into the following steps
Step I $2A \rightleftharpoons X$ fast
Step II $X + B \rightleftharpoons Y$ slow
Step III $Y + B \rightleftharpoons$ Product fast
The rate law for the overall reaction is
(1) rate = $k[A]^2$ (2) rate = $k[B]^2$
(3) rate = $k[A][B]^2$ (4) rate = $k[A]^2[B]$
Ans. (4)

185. A solution is 0.1 M with respect to Ag^+, Ca^{2+}, Mg^{2+} and Al^{3+} which will precipitate at lowest concentration of $[PO_4^{3-}]$ when solution of Na_3PO_4 is added?
(1) $Ag_3PO_4(K_{SP} = 1 \times 10^{-6})$
(2) $Ca_3(PO_4)_2(K_{SP} = 1 \times 10^{-33})$
(3) $Mg_3(PO_4)_2(K_{SP} = 1 \times 10^{-24})$
(4) $AlPO_4(K_{SP} = 1 \times 10^{-20})$
Ans. (4)

186. In Tollen's test, aldehydes
(1) are oxidised
(2) are reduced to alcohol
(3) neither reducer nor oxidised
(4) precipitate Ag^+ as AgCl
Ans. (1)

187. The half life time of 2g sample of radioactive nuclide 'X' is 15 min. The half time of 1 g sample of X is
(1) 7.5 min (2) 15 min
(3) 22.5 min (4) 30 min
Ans. (2)

188. Given a gas phase reaction
$2A_{(g)} + B_{(g)} \rightleftharpoons C_{(g)} + D_{(g)}$
Which one of the following changes will affect the value of K_C?
(1) Addition of inert gas
(2) Addition of catalyst
(3) Addition of reactants
(4) Increasing in temperature
Ans. (4)

189. Lowest pka is associated with
(1) 
(2) 
(3) 
(4) 
Ans. (3)

190. Monobromination of 2-methylbutane gives how many distinct isomers?
(1) One (2) Two
(3) Three (4) Four
Ans. (4)

191. α-(D) glucose $\rightleftharpoons$ β-(D) glucose, equilibrium constant for this is 1.8. The percentage of α-(D) glucose at equilibrium is

(1) 35.7 (2) 55.6

(3) 44.4 (4) 64.3

Ans. (1)

192. Equal weights of CH_4 and H_2 are mixed in a container at 25°C. Fraction of total pressure exerted by methane is

(1) $\frac{1}{2}$ (2) $\frac{1}{3}$

(3) $\frac{1}{9}$ (4) $\frac{8}{9}$

Ans. (3)

193. In which one of the given formulae of xenon compounds there are five σ-bonds and three π-bobds in it?

(1) XeFO (2) XeF_2O_2

(3) XeF_3O_2 (4) XeF_2O_3

Ans. (4)

194. More acidic than ethanol is

(1) $CH_3CH_2CH_2CH_2CH_2CH_2CH_3$

(2) $CH_3CO_2CH_2CH_3$

(3) $CH_3COCH_2COCH_3$

(4) CH_3COCH_3

Ans. (3)

195. Of the followings, the oxime of which shows geometrical isomerism, is

(1) Acetone (2) Diethylketone

(3) Formaldehyde (4) Benzaldehyde

Ans. (4)

196. Decreasing order of reactivity of hydrogen halide acid in the conversion of ROH → RX is

(1) HCl > HBr > HI > HF

(2) HI > HBr > HCl > HF

(3) HF > HCl > HBr > HI

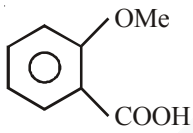
(4) HF > HBr > HI > HCl

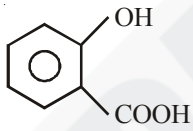
Ans. (2)

197. Which is correct statement?

(1) *o*-Nitrobenzoic acid is stronger than 3,5 dinitrobenzoic acid in H_2O

(2) Branched carboxylic acids are more acidic than unbranched acids

(3) 

is stronger acid than


(4) Butanoic acid is stronger acid than succinic acid

Ans. (1)

198. Maximum efficiency of a commercial refrigerator which operates between –10° (inside temperature) and 25°C (outside temperature) is

(1) 13.3% (2) 11.45%

(3) 24.75% (4) 20%

Ans. (2)

199. 1×10^{-3} m solution of $Pt(NH_3)_4Cl_4$ in H_2O shows depression in freezing point by 0.0054°C. The structure of the compound will be (Given K_{fp} (H_2O) = 1.860 km^{-1})

(1) $[Pt(NH_3)_4]Cl_4$ (2) $[Pt(NH_3)_4Cl]Cl_3$

(3) $[Pt(NH_3)_2Cl_2]Cl_2$ (4) $[Pt(NH_3)Cl_3]Cl$

Ans. (1)

200. The typical range of molar enthalpies for the strongest intermolecular (Hydrogen) bonds is

(1) 200 – 300 kJ (2) 300 – 500 kJ

(3) 4 – 25 kJ (4) 4 – 25 J

Ans. (3)

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