

76. The hydrogen electrode is dipped in a solution of Fe^{2+} ions. The potential of the cell would be (the value of $2.303 RT / E$ is 0.059 V)
- (a) 0.177 V (b) 0.087 V
(c) -0.177 V (d) 0.059 V

77. Specific conductivity of a solution :
- (a) increases with dilution
(b) decreases with dilution
(c) remains unchanged with dilution
(d) depends on mass of electrolyte

78. 1 mol of H_2SO_4 is mixed with 2 moles of NaOH. The heat evolved will be :
- (a) 57.3 kJ
(b) 2×57.3 kJ
(c) $57.3/2$ kJ
(d) cannot be predicted

79. In a reversible process, $\Delta S_{\text{system}} + \Delta S_{\text{surrounding}}$ is :
- (a) > 0 (b) < 0
(c) ≥ 0 (d) $= 0$

80. For the reaction, $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$; $\Delta H = ?$
- (a) $\Delta E + 2RT$ (b) $\Delta E - 2RT$
(c) $\Delta E + RT$ (d) $\Delta E - RT$

81. One mole of a perfect gas expands isothermally to ten times its original volume. The change in entropy is :
- (a) $0.1 R$ (b) $2.303 R$
(c) $10.0 R$ (d) $100.0 R$

82. Which of the following solutions will have the highest boiling point?
- (a) 0.1 M FeCl_3 (b) 0.1 M BaCl_2
(c) 0.1 M NaCl (d) 0.1 M urea

83. Maximum freezing point falls in :
- (a) camphor (b) naphthalene
(c) benzene (d) water

84. Azeotropic mixture of HCl and water has :
- (a) 48% HCl (b) 22.2% HCl
(c) 36% HCl (d) 20.2% HCl

85. Vapour pressure of dilute aqueous solution of glucose is 750 mm of mercury at 373 K. The mole fraction of solute is :
- (a) $\frac{1}{76}$ (b) $\frac{1}{7.6}$
(c) $\frac{1}{38}$ (d) $\frac{1}{10}$

86. Volume of 0.1 M $\text{K}_2\text{Cr}_2\text{O}_7$ required to oxidize 35 mL of 0.5 M FeSO_4 solution is
- (a) 29.2 mL (b) 17.5 mL
(c) 175 mL (d) 145 mL

87. 100 cc of 0.6 N H_2SO_4 and 200 cc of 0.3 N HCl were mixed together. The normality of the solution will be :
- (a) 0.2 N (b) 0.4 N
(c) 0.8 N (d) 0.6 N

88. The rate of diffusion of a gas is proportional to :
- (a) $\frac{P}{\sqrt{d}}$ (b) $\sqrt{\frac{P}{d}}$
(c) $\frac{P}{d}$ (d) $\frac{\sqrt{P}}{d}$

89. Molar volume of CO_2 is maximum at :
- (a) NTP
(b) 0°C and 2.0 atm
(c) 127°C and 1 atm
(d) 273°C and 2.0 atm

90. Number of atoms of oxygen present in 10.6 g of Na_2CO_3 will be :
- (a) 6.02×10^{23} (b) 12.04×10^{22}
(c) 1.806×10^{23} (d) 31.80×10^{28}

91. The equilibrium $\text{P}_4(\text{s}) + 6\text{Cl}_2(\text{g}) \rightleftharpoons 4\text{PCl}_3(\text{g})$ is attained by mixing equal moles of P_4 and Cl_2 in an evacuated vessel. Then at equilibrium is :
- (a) $[\text{Cl}_2] > [\text{PCl}_3]$ (b) $[\text{Cl}_2] > [\text{P}_4]$
(c) $[\text{P}_4] > [\text{Cl}_2]$ (d) $[\text{PCl}_3] > [\text{P}_4]$

92. The activation energy for most of the reactions is approximately 50 kJ mol^{-1} . The value of temperature coefficient for such reactions is :
- (a) > 2 (b) > 3
(c) < 1 (d) > 4

93. If the mass defect of ${}^9_4\text{X}$ is 0.090 amu, then binding energy per nucleon is :
- (1 amu = 931.5 MeV)

- (a) 9.315 MeV (b) 931.5 MeV
(c) 83.0 MeV (d) 8.38 MeV

94. 50 mL of 0.1 M HCl and 50 mL of 0.2 M NaOH are mixed. The pH of the resulting solution is :
- (a) 1.30 (b) 4.2
(c) 12.70 (d) 11.70

95. A substance A_xB_y crystallises in a face centred cubic lattice. In addition, atom A occupies each corner of cube and atom B occupies the centres of each face of the cube. Identify the correct composition of the substance A_xB_y :
- AB_3
 - A_4B_3
 - A_3B
 - composition cannot be specified
96. In coagulating the colloidal solution of As_2S_3 which has the maximum coagulating value?
- $NaCl$
 - KCl
 - $BaCl_2$
 - $AlCl_3$
97. Which of the following is the strongest oxidising agent?
- $HOCl$
 - $HClO_2$
 - $HClO_3$
 - $HClO_4$
98. In the equation
- $$4M + 8CN^- + 2H_2O + O_2 \longrightarrow 4[M(CN)_2]^- + 4OH^-$$
- Identify the metal M . It is
- copper
 - iron
 - silver
 - zinc
99. The formula of azurite is :
- $CuCO_3 \cdot Cu(OH)_2$
 - $2CuCO_3 \cdot Cu(OH)_2$
 - $CuCO_3 \cdot 2Cu(OH)_2$
 - $CuSO_4 \cdot Cu(OH)_2$
100. The decreasing order of bond angle is :
- $NO_2 > NO_2^+ > NO_2^-$
 - $NO_2^- > NO_2 > NO_2^+$
 - $NO_2^+ > NO_2 > NO_2^-$
 - $NO_2^+ > NO_2^- > NO_2$
101. The fresh precipitate can be transformed in colloidal state by :
- peptization
 - coagulation
 - diffusion
 - none of these
102. Milk is :
- fat dispersed in water
 - fat dispersed in milk
 - fat dispersed in fat
 - water dispersed in milk
103. Purest form of iron is :
- cast iron
 - pig iron
 - wrought iron
 - steel
104. Most unstable hydride is :
- NH_3
 - PH_3
 - AsH_3
 - BiH_3
105. Out of the following metals that cannot be obtained by electrolysis of their aqueous solution of their salts are :
- Ag
 - Cr
 - Cu
 - Mg
106. KI and $CuSO_4$ solution when mixed gives :
- $CuI_2 + K_2SO_4$
 - $Cu_2I_2 + K_2SO_4$
 - $K_2SO_4 + Cu_2I_2 + I_2$
 - $K_2SO_4 + CuI_2 + I_2$
107. The strongest reducing agent among the following is :
- F^-
 - Cl^-
 - Br^-
 - I^-
108. XeF_6 on complete hydrolysis gives :
- Xe
 - XeO_2
 - XeO_3
 - XeO_4
109. The correct name of the compound $[Cu(NH_3)_4](NO_3)_2$, according to IUPAC system is :
- cuprammonium nitrate
 - tetrammine copper(II) dinitrate
 - tetrammine copper(II) nitrate
 - tetrammine copper(II) dinitrite
110. Which of the following complex species does not involve inner orbital hybridisation?
- $[CoF_6]^{3-}$
 - $[Co(NH_3)_6]^{3+}$
 - $[Fe(CN)_6]^{3-}$
 - $[Cr(NH_3)_6]^{3+}$
111. $^{60}_{27}Co$ is radioactive because :
- its atomic number is high
 - it has high $\frac{p}{n}$ ratio
 - it has high $\frac{n}{p}$ ratio
 - none of the above
112. The correct order of solubility of the sulphates of alkaline earth metals in water is :
- $Be > Ca > Mg > Ba > Sr$
 - $Mg > Be > Ba > Ca > Sr$
 - $Be > Mg > Ca > Sr > Ba$
 - $Mg > Ca > Ba > Be > Sr$
113. Correct order of radii is :
- $N < Be < B$
 - $F^- < O^{2-} < N^{3-}$
 - $Na < Li < K$
 - $Fe^{3+} < Fe^{2+} < Fe^{4+}$
114. A sudden large jump between the values of first and second ionisation energies of elements would be associated with which of the following electronic configurations?

- (a) $1s^2 2s^2 2p^6 3s^2 3p^1$
 (b) $1s^2 2s^2 2p^6 3s^2 3p^1$
 (c) $1s^2 2s^2 2p^6 3s^1 3p^2$
 (d) $1s^2 2s^2 2p^6 3s^2$

115. Which one shows most pronounced inert pair effect?

- (a) Si (b) Sn
 (c) Pb (d) C

116. Which of the following will form a colourless complex?

- (a) Ni^{2+} (b) Cu^+
 (c) Ti^{2+} (d) Fe^{3+}

117. Silver containing lead as impurity is purified by :

- (a) poling (b) cupellation
 (c) lavigation (d) distillation

118. The metal extracted by cyanide process is :

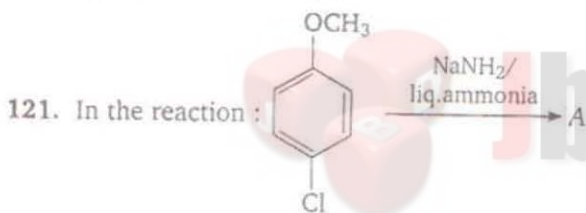
- (a) silver (b) copper
 (c) iron (d) sodium

119. On the extraction of iron, the slag produced is :


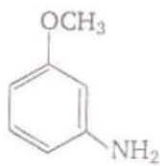
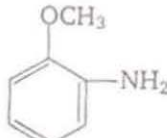
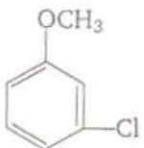
- (a) CO (b) $FeSiO_3$
 (c) $MgSiO_3$ (d) $CaSiO_3$

120. Complex forming tendency is more for :

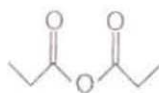
- (a) Na^+ (b) K^+
 (c) Li^+ (d) Rb^+



The major product A is :





- (a)  (b) 
 (c)  (d) 

122. The IUPAC name of the following compound is :



- (a) propionic anhydride
 (b) dipropanoic anhydride
 (c) ethoxy propanoic acid
 (d) propanoic anhydride

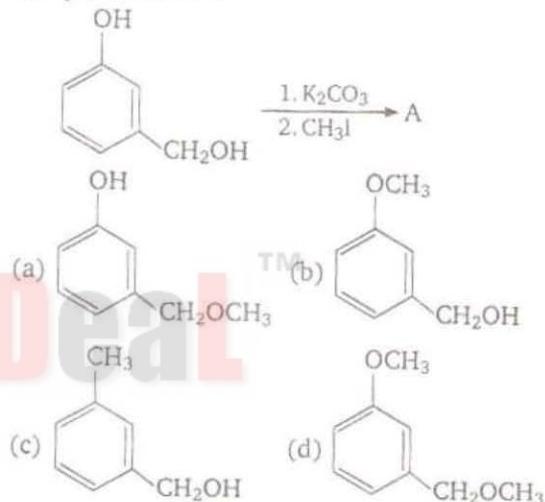
123. Which of the following compounds is not aromatic?

- (a)  (b) 
 (c)  (d) 


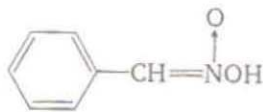
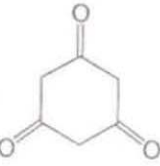

124. Which of the following is the most stable cation?

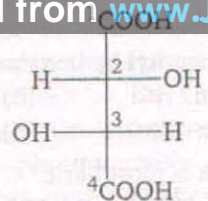
- (a) $F_3C-CH_2^+$ (b) $(CH_3)_2CH^+$
 (c) CH_3^+ (d) CF_3^+

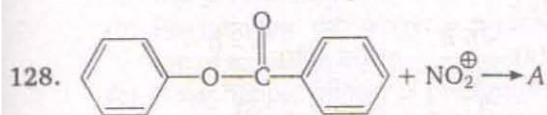
125. The product A is :



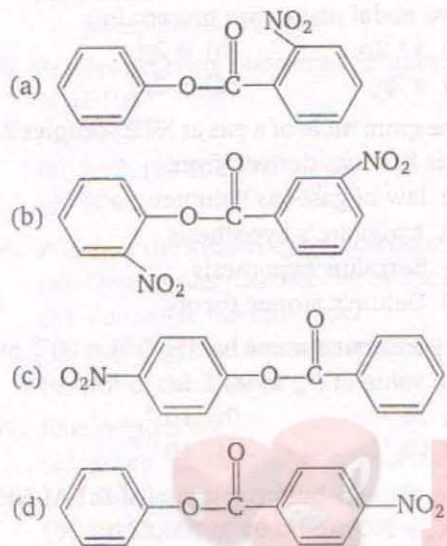
126. Tautomerism is not exhibited by :

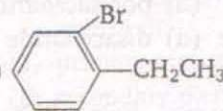
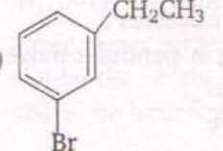
- (a) 
 (b) 
 (c) 
 (d) 

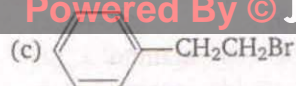
127. In the compound  configuration at C₂ and C₃ atoms are :
 (a) S, S (b) R, S
 (c) S, R (d) R, R



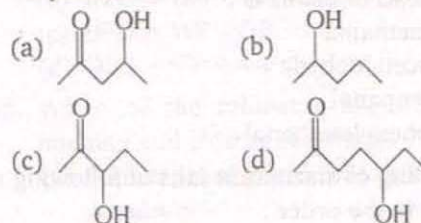
The product A is :



129. Hinsberg reagent is :
 (a) C₆H₅SO₃H (b) C₆H₅NO
 (c) C₆H₅SO₂Cl (d) C₆H₅N₂Cl
130. Acetaldehyde cannot show :
 (a) iodoform test
 (b) Lucas test
 (c) Benedict's test
 (d) Tollen's test
131. Ethylbenzene with bromine in presence of FeBr₃, predominantly gives :
 (a) 
 (b) 



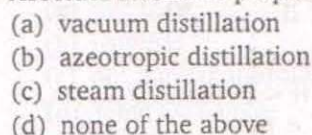
132. Which of the following will be most readily dehydrated under acidic conditions ?



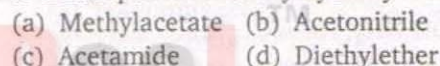
133. Which of the following cannot reduce Fehling solution?



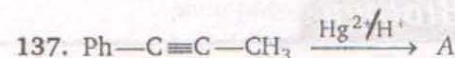
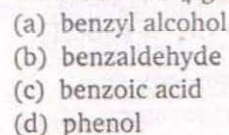
134. Absolute alcohol is prepared by :



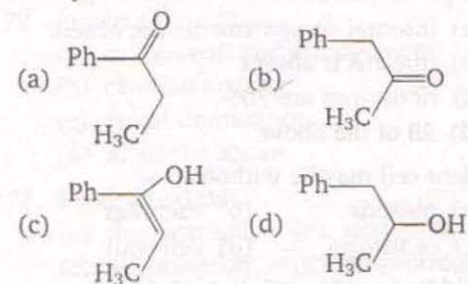
135. Which of the following compounds is resistant to nucleophilic attack by hydroxyl ion?



136. Hydrogenation of benzoyl chloride in presence of Pd on BaSO₄ gives :



The product A is :



138. Ethylamine reacts with nitrous acid to form :

