121. 2-Methylbutane on reacting with bromine in the presence of sunlight gives mainly
1) 1-bromo-3-methylbutane
2) 2-bromo-3-methylbutane
3) 2-bromo-2-methylbutane
4) 1-bromo-2-methylbutane

Ans. (3)

The reaction proceeds through free radical mechanism.

122. Which of the following compounds shows optical isomerism ?

1) $[Co(CN)_6]^{3-}$ 2) $[Cr(C_2O_4)_3]^{3-}$

3) $[ZnCl_4]^{2-}$ 4) $[Cu(NH_3)_4]^{2+}$

Ans. (2)

Due to lack of symmetry $[Cr(C_2O_4)_3]^{3-}$ shows optical isomerism.

123. Which one of the following cyano complexes would exhibit the lowest value of paramagnetic behaviour?

1) $[Co(CN)_6]^{3-}$ 2) $[Fe(CN)_6]^{3-}$

3) $[Mn(CN)_6]^{3-}$ 4) $[Cr(CN)_6]^{3-}$

(At. Nos : Cr = 24, Mn = 25, Fe = 26, Co = 27)

Ans. (1)

In $[Co(CN)_6]^{3-}$, Co is

in +3 state and has d^6 configuration, the six

electrons get paired-up in presence of a strong filed ligand like $CN^{(-)}$

124. The best reagent to convert pent-3-en-2-ol into pent-3-in-2-one is
1) Pyridinium chloro-chromate
2) Chromic anhydride in glacial acetic acid
3) Acidic dichromate
4) Acidic permanganate

ans. (1)

Pyridinium chloro-chromate oxidizes an alcoholic group selectively in the presence of carbon-carbon double bond.

125. A photon of hard gamma radiation knocks a proton out of $^{24}_{12}\text{Mg}$ nucleus to form

1) the isobar of $^{23}_{11}\text{Na}$
2) the nuclide $^{23}_{11}\text{Na}$
3) the isobar of parent nucleus
4) the isotope of parent nucleus

Ans. (2)

$^{24}_{12}\text{Mg} + \gamma \rightarrow {}_{11}\text{Na}^{23} + {}^{1}_{1}\text{p}$

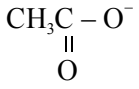
126. Reaction of one molecule of HBr with one molecule of 1,3-butadiene at 40^0C gives predominantly
1) 1-bromo-2-butene under kinetically controlled conditions
2) 3-bromobutene under thermodynamically controlled conditions
3) 1-bromo-2-butene under thermodynamically controlled conditions
4) 3-bromobutene under kinetically controlled conditions

Ans. (3) $CH_2 = CH - CH = CH_2 + HBr \overset{1,4 addition}{\rightarrow}$

$CH_3 - CH = CH - CH_2 - Br$

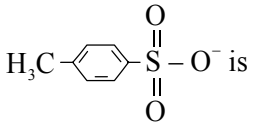
1- bromo-2-Butene

127. The decreasing order of nucleophilicity among the nucleophiles

a) 

b) CH_3O^-

c) CN^-

d)  is

1) (c), (b), (a), (d)
2) (b), (c), (a), (d)
3) (d), (c), (b), (a)
4) (a), (b), (c), (d)

Ans. (2)

$\because$ strong bases are generally good nucleophiles

128. Tertiary alkyl halides are practically inert to substitution by S_{N^2} mechanism because of

1) steric hindrance
2) inductive effect
3) instability
4) insolubility

Ans. (1)

In S_N2 reaction mechanism reactivity of allkyl halide depends on stability of transition state which decreases with steric hindrance in allkyl hallide.

129. In both DNA and RNA, heterocylic base and phosphate ester linkages are at -

(1) C_5' and C_1' respectively of the sugar molecule

2) C_1' and C_5' respectively of the sugar molecule

3) C_2' and C_5' respectively of the sugar molecule

4) C_5' and C_2' respectively of the sugar molecule

Ans. (2)

130. Among the following acids which has the lowest pK_a value ?

1) CH_3CH_2COOH
2) $(CH_3)_2)$ CH – COOH
3) HCOOH
4) CH_3COOH

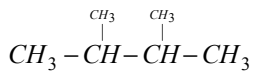
Ans. (3)

Strong acids have low value of pK_a

131. Of the five isomeric hexanes, the isomer which can give two monochlorinated compounds is

1) 2-methylpentane
2) 2, 2-dimethylbutane
3) 2, 3-dimethylbutane
4) n-hexane

Ans. (3)



The molecule contains two types of hydrogens only.
Therefore can give two mono chlorinated compounds.

132. Alkyl halides react with dialkyl copper reagents to give

1) alkenyl halides
2) alkanes
3) alkyl copper halides
4) alkenes

Ans. (2)

$2R^1 - x + R_2Cu \rightarrow R^1 - R + CuX_2$

(Corey - House synthesis)

133. Which one of the following methods is neither meant for the synthesis nor for separation of amines ?

1) Curtius reaction
2) Wurtz reaction
3) Hofmann method
4) Hinsberg method

Ans. (2) Wartz's rxn gives alkanes.

134. Which types of isomerism is shown by 2, 3- dichlorobutane ?

1) Structural
2) Geometric
3) Optical
4) Diastereo

Ans. (3)

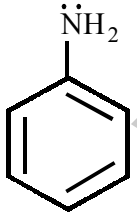
The molecule has two chirality centres.

135. Amongst the following the most basic compound is

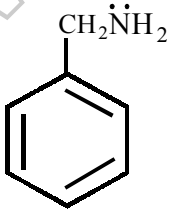
1) p-nitroaniline
2) acetanilide
3) aniline
4) benzylamine

Ans. (4)

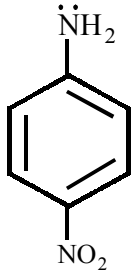
Due to resonance of electron pair in aniline basic strength decreases. In benzylamine electron pair is not involve in resonance.



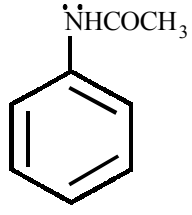
(I)



(II)



(III)



(IV)

Decreasing order of basic strength is (II) > (I) > (IV) > (III)