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## MODEL PAPER - 1 <br> CHEMISTRY

121. The density of a gas is $1.78 \mathrm{~g} \mathrm{~L}^{-1}$ at STP. The weight of one mole of gas is (Some Basic concept of chemistry)
1) 39.9 gr
2) 22.4 g
3) 3.56 g
4) 29 g
122. Which of the following species is isoelectronic with CO ?
(Structure of Atom)
1) HF
2) $\mathrm{N}_{2}$
3) $\mathrm{N}_{2}{ }^{+}$
4) $\mathrm{O}_{2}^{-}$
123. What will be the wavenumber of yellow radiation having wavelength 240 nm ? (Structure of Atom)
1) $1.724 \times 10^{4} \mathrm{~cm}^{-1}$
2) $4.16 \times 10^{6} \mathrm{~m}^{-1}$
3) $4 \times 10^{14} \mathrm{~Hz}$
4) $219.3 \times 10^{3} \mathrm{~cm}^{-1}$
124. What is the name and symbol of the element with atomic number 112 ?
(Classification of elements)
1) Ununbium Uub ?
2) Unnilbium, Unb
3) Ununnillum, Uun
4) Ununtrium, Uut
125. How many and what types of bonds are present in $\mathrm{NH}_{4}^{+}$? (Chemical Bonding \& Molecular structure)
1) Four covalent bonds
2) Three covalent bonds and one ionic bond
3) Four ionic bonds
4) Three covalent bonds and one coordinate bond
126. In which of the following molecules octet rule is not followed? (Chemical Bonding \& Molecular structure)
1) $\mathrm{NH}_{3}$
b) $\mathrm{CH}_{4}$
c) $\mathrm{CO}_{2}$
d) NO
127. What is the effect on the pressure of a gas if its temperature is increased at constant volume ?
(States of Matter)
1) The pressure of the gas increases
2) The pressure of the gas decreases
3) The pressure of the gas remains same
4) The pressure of the gas becomes double.
128. A flask of capacity 2 L is heated from $35^{\circ} \mathrm{C}$ to $45^{\circ} \mathrm{C}$. What volume of air will escape from the flask?
1) 10 mL
2) 20 mL
3) 60 mL
4) 50 mL
130. For the following reactions: $\mathrm{NO}_{(\mathrm{g})}+\mathrm{O}_{3(\mathrm{~g})} \rightleftharpoons \mathrm{NO}_{2(\mathrm{~g})}+\mathrm{O}_{2(\mathrm{~g})}$. The value of $\mathrm{K}_{\mathrm{c}}$ is $8.2 \times 10^{4}$. What will be the value of $\mathrm{K}_{\mathrm{c}}$ for the reverse reaction ?
(States of Matter)
131. In an adiabtic expansion of ideal gas
3) $\Delta E=0$
4) $W=0$
5) $W=-\Delta E$
6) $W=\Delta E$
7) $8.2 \times 10^{4}$
8) $\frac{1}{8.2 \times 10^{4}}$
9) $\left(8.2 \times 10^{4}\right)^{2}$
10) $\sqrt{8.2 \times 10^{4}}$
(Equilibrium)
131. Which type of redox reaction is shown by the following reaction?

$$
\stackrel{0}{\mathrm{C}}_{2(\mathrm{~g})}+2 \mathrm{KKBr}_{(\mathrm{aq})}^{+1-1} \rightarrow 2 \mathrm{~K}_{\mathrm{Cl}}^{(\mathrm{aq})}+\mathrm{Br}_{2(\ell)}^{0}
$$

(Redox Reactions)

1) Decomposition reaction
2) Metal displacement reaction
3) Non-metal displacement reaction
4) Disproportionation reaction
132. What is the oxidation number of carbon in $\mathrm{C}_{3} \mathrm{O}_{2}$ (carbon suboxide)?
(Redox Reactions)
1) $+4 / 3$
2) $+10 / 4$
3) +2
4) $+2 / 3$
133. A deuterium is
1) an electron with a positive charge
2) a nucleus having two protons
3) a nucleus containing a neutron and two protons 4) a nucleus containing a neutron and a proton
134. Which of the following alkali metals when burnt in air forms a mixture of oxide as well as nitride?
(S-Block elements)
1) K
2) Na
3) Li
4) Cs
135. Anhydrous $\mathrm{AlCl}_{3}$ fumes in air. What is the reason for it?
1) It is hygroscopic in nature.
2) It gives out chlorine when exposed to air.
3) It is hydrolysed in moist air giving out fumes of HCl .
4) It loses water when exposed to moist air.
136. The decreasing order of power of boron halides to act as Lewis acids is
(P-Block elements)
1) $\mathrm{BF}_{3}>\mathrm{BCl}_{3}>\mathrm{BBr}_{3}$
2) $\mathrm{BBr}_{3}>\mathrm{BCl}_{3}>\mathrm{BF}_{3}$
3) $\mathrm{BCl}_{3}>\mathrm{BF}_{3}>\mathrm{BBr}_{3}$
4) $\mathrm{BCl}_{3}>\mathrm{BBr}_{3}>\mathrm{BF}_{3}$
137. Which type of hybridisation of each carbon is there in the compound? $\mathrm{CH}_{3}-\mathrm{CH}=\mathrm{CH}-\mathrm{CN}$
(Organic chemistry-some Basic Principle)
1) $s p^{3}, s p^{2}, s p^{2}, s p$
2) $s p^{3}, s p^{2}, s p^{2}, s p^{3}$
3) $s p^{3}, s p^{2}, s p^{3}, s p^{3}$
4) $s p^{3}, s p^{2}, s p, s p^{3}$
138. Which of the following compounds gives methane on reaction with water?
(Hydro Carbons)
1) $\mathrm{CaC}_{2}$
2) $B_{4} C$
3) SiC
4) $\mathrm{Al}_{4} \mathrm{C}_{3}$
139. The number of chain isomers possible for hydrocarbon $\mathrm{C}_{5} \mathrm{H}_{12}$ is
(Hydro Carbons)
1) 3
2) 5
3) 4
140. Which of the following is a greenhouse gas?
1) $\mathrm{SO}_{2}$
2) $\mathrm{H}_{2} \mathrm{~S}$
3) $\mathrm{CO}_{2}$

Environmental Chemistry)
141. Which of the following primitive cells show the given parameters ? $a \neq b \neq c, \alpha=\beta=\gamma=90^{\circ}$
(Solid State)

1) Cubic
2) Tetragonal
3) Orthorhombic
4) Hexagonal
142. What is the molarity of a solution containing 10 g of NaOH in 500 mL of solution?
1) $0.25 \mathrm{~mol} \mathrm{~L}^{-1}$
2) $0.75 \mathrm{~mol} \mathrm{~L}^{-1}$
3) $0.5 \mathrm{~mol} \mathrm{~L}^{-1}$
4) $1.25 \mathrm{~mol} \mathrm{~L}^{-1}$
143. In the cell, $\mathrm{Zn}\left|\mathrm{Zn}^{2+}\right|\left|\mathrm{Cu}^{2+}\right| \mathrm{Cu}$, the negative terminal is
(Electro Chemistry)
1) Cu
2) $\mathrm{Cu}^{2+}$
3) Zn
4) $\mathrm{Zn}^{2+}$
144. Electrode potential data of few cells is given below. Based on the data, arrange the ions in increasing order of their reducing power.
$\mathrm{Fe}_{(\mathrm{aq})}^{3+}+\mathrm{e}^{-} \rightarrow \mathrm{Fe}_{(\mathrm{aq})}^{2+} ; \quad \mathrm{E}^{0}=+0.77 \mathrm{~V}$
$\mathrm{Al}_{(\mathrm{aq})}^{3+}+3 \mathrm{e}^{-} \rightarrow \mathrm{Al}_{(\mathrm{s})} ; \quad \mathrm{E}^{0}=-1.66 \mathrm{~V}$
$\mathrm{Br}_{2 \text { (aq) }}+2 \mathrm{e}^{-} \rightarrow 2 \mathrm{Br}_{\text {(aq) }}^{-} ; \quad \mathrm{E}^{0}=+1.09 \mathrm{~V}$
(Electro Chemistry)
1) $\mathrm{Br}<\mathrm{Fe}^{2+}<\mathrm{Al}$
2) $\mathrm{Fe}^{2+}<\mathrm{Al}<\mathrm{Br}^{-}$
3) $\mathrm{Al}<\mathrm{Br}^{-}<\mathrm{Fe}^{2+}$
4) $\mathrm{Al}<\mathrm{Fe}^{2+}<\mathrm{Br}^{-}$
145. For a reaction $R \rightarrow P$, the concentration of a reactant changes from 0.05 M to 0.04 M in 30 minutes. What will be the average rate of reaction in minutes?
(Chemical Kinetics)
1) $4 \times 10^{-4} \mathrm{M} \mathrm{min}^{-1}$
2) $8 \times 10^{-4} \mathrm{M} \mathrm{min}^{-1}$
3) $3.3 \times 10^{-4} \mathrm{M} \mathrm{min}^{-1}$
4) $2.2 \times 10^{-4} \mathrm{M} \mathrm{min}^{-1}$
146. For the reaction $4 \mathrm{NH}_{3}+5 \mathrm{O}_{2} \rightarrow 4 \mathrm{NO}+6 \mathrm{H}_{2} \mathrm{O}$, If the rate of disappearence of $\mathrm{NH}_{3}$ is $3.6 \times 10^{-3} \mathrm{~mol} \mathrm{~L}^{-1} \mathrm{~s}^{-1}$, what is the rate of formation of $\mathrm{H}_{2} \mathrm{O}$ ?
(Chemical Kinetics)
1) $5.4 \times 10^{-3} \mathrm{~mol} \mathrm{~L}^{-1} \mathrm{~s}^{-1}$
2) $3.6 \times 10^{-3} \mathrm{~mol} \mathrm{~L}^{-1} \mathrm{~s}^{-1}$
3) $4 \times 10^{-4} \mathrm{~mol} \mathrm{~L}^{-1} \mathrm{~s}^{-1}$
4) $0.6 \times 10^{-4} \mathrm{~mol} \mathrm{~L}^{-1} \mathrm{~s}^{-1}$
147. Which of the following is less than zero during adsorption?
(Surface Chemistry)
1) $\Delta G$
2) $\Delta S$
3) $\Delta \mathrm{H}$
4) All of these
148. Which of the following is not an ore of magnesium? (Genral Principles and Process of /solation of elements)
1) Carnallite
2) magnesite
3) Dolomite
4) Gypsum
149. Nitrogen shows different oxidation states ranging from
(P-Block Elements)
1) -3 to +5
2) -5 to +5
3) 0 to -5
4) -3 to +3
150. Which of the following species has the highest dipole moment?
$\begin{array}{lll}\text { 1) } \mathrm{SbH} & \text { 2) } \mathrm{PH} & \text { 3) } \mathrm{NH}\end{array}$
(P-Block Elements)
1) $\mathrm{SbH}_{3}$
2) $\mathrm{PH}_{3}$
3) $\mathrm{AsH}_{3}$
151. $\mathrm{Fe}^{3+}$ compounds are more stable than $\mathrm{Fe}^{2+}$ compounds because (d-and
$\begin{array}{ll}\text { 1) } \mathrm{Fe}^{3+} \text { has smaller size than } \mathrm{Fe}^{2+} & \text { 2) } \mathrm{Fe}^{3+} \text { has } 3 \mathrm{~d}^{5} \text { configuration (half - filled) }\end{array}$
(d-and-f-block elements)
1) Fe has smaller size than $\mathrm{Fe}^{2}$
2) $\mathrm{Fe}^{3+}$ is paramagnetic in nature
152. The number of ions given by $\left[\mathrm{Pt}\left(\mathrm{NH}_{3}\right)_{6}\right] \mathrm{Cl}_{4}$ in aqeous solution will be
(Co-ordination Compounds)
1) Two
2) Three
3) Five
4) eleven
153. Which of the following is a primary halide?
(HaloAlkanes \& Halo Arenes)
3) ter- Butylbromide
4) iso - Propyliodide
5) sec-Butyliodide
6) neo-hexylchoride
154. An alkene $\mathrm{CH}_{3} \mathrm{CH}=\mathrm{CH}_{2}$ is treated with $\mathrm{B}_{2} \mathrm{H}_{6}$ in presence of $\mathrm{H}_{2} \mathrm{O}_{2}$. The final product formed is
(Alcohols, Phenols and ethers)
1) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CHO}$
2) $\mathrm{CH}_{3} \mathrm{CH}(\mathrm{OH}) \mathrm{CH}_{3}$
3) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{OH}$
4) $\left(\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2}\right)_{3} \mathrm{~B}$
155. In the following reaction, product ( $p$ ) is

(Aldehydes, Ketones \& Carboxylic acids)
1) RCHO
2) $\mathrm{RCH}_{3}$
3) RCOOH
4) $\mathrm{RCH}_{2} \mathrm{OH}$
156. Ozonolysis of an organic compound gives formaldehyde as one of the products. This confirms the presence of (Aldehydes, Ketones \& Carboxylic acids)
1) Two ethylenic double bonds
2) a vinyl group
3) an isopropyl group
4) an acetylenic triple bond
157. Identify $\mathrm{X}, \mathrm{Y}$ and Z in the given reaction:

(Amines)

| $\boldsymbol{X}$ | $\boldsymbol{Y}$ | $\boldsymbol{Z}$ |
| :--- | :--- | :--- |
| 1) $\mathrm{X}-\mathrm{CH}_{2} \mathrm{Br}-\mathrm{CH}_{2} \mathrm{Br}$ | $\mathrm{Y}-\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{CN}$ | $\mathrm{Z}-\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{NH}_{3}$ |
| 2) $\mathrm{X}-\mathrm{CH}_{2} \mathrm{Br}-\mathrm{CH}_{2} \mathrm{Br}$ | $\mathrm{Y}-\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CN}$ | $\mathrm{Z}-\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{NH}_{2}$ |
| 3) $\mathrm{X}-\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{Br}$ | $\mathrm{Y}-\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CN}$ | $\mathrm{Z}-\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{NH}_{2}$ |
| 4) $\mathrm{CH}_{2} \mathrm{Br}^{2}-\mathrm{CH}_{2} \mathrm{Br}$ | $\mathrm{Y}-\mathrm{NCCH}_{2} \mathrm{CH}_{2} \mathrm{CN}$ | $\mathrm{Z}-\mathrm{H}_{2} \mathrm{NCH}_{2} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{NH}_{2}$ |

158. Invert sugar is
1) a type of cane sugar
2) Optically inactive form of sugar
3) Mixture of glucose and galactose
4) Mixture of glucose and fructose in equimolar quantities
159. The $S$ in buna - $S$ refers to
(Polymers)
1) Sulphur
2) Styrene
3) sodium
160. Barbituric acid and its derivatives are well known as
1) Tranquilizers
2) antiseptics
3) analgesics
4) salicylate
(Chemistry in everyday life)
5) antipyretics

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## MODEL PAPER - 2

## CHEMISTRY

121. Total number of atoms present in 34 g of $\mathrm{NH}_{3}$ is
(Some Basic concept of chemistry)
1) $4 \times 10^{23}$
2) $4.8 \times 10^{21}$
3) $2 \times 10^{23}$
4) $48 \times 10^{23}$
122. compare the energies of two radiations $E_{1}$ with wavelength 800 nm and $\mathrm{E}_{2}$ with wavelength 400 nm .
(Structure of Atom)
1) $E_{1}=2 E_{2}$
2) $E_{1}=E_{2}$
3) $E_{2}=2 E_{1}$
4) $E_{2}=-\frac{1}{2} E_{1}$
123. The energy difference between the ground state of an atom and its excited state is $3 \times 10^{-19} \mathrm{~J}$. What is the wavelength of the photon required for this transition?
(Structure of Atom)
1) $6.6 \times 10^{-34} \mathrm{~m}$
2) $3 \times 10^{-8} \mathrm{~m}$
3) $1.8 \times 10^{-7} \mathrm{~m}$
4) $6.6 \times 10^{-7} \mathrm{~m}$
124. The Period to which an element belongs to in the long form of periodic table represents
(Classification of elements)
1) Atomic mass
2) Atomic number
3) Principal quantum number
4) Azimuthal quantum number.
125. Two elements $P$ and $Q$ combine to form a compound. $P$ has 2 and $Q$ has 6 electrons in their outermost shell. What will be formula of the compound formed?
(Chemical Bonding \& Molecular
structure)
1) $P Q$
2) $P_{2} Q$
3) $P_{2} Q_{3}$
4) $P Q_{2}$
126. What is the formal charge on carbon atom in the following two structures :

(Chemical Bonding \& Molecular structure)
1) $0,-2$
2) 0,0
3) $+2,-2$
4) $+1,-1$
127. The relations between various variables of gaseous substances are given in the table along with their formulae. Mark the incorrect relationship.
(States of Matter)
1) Density and molar mass: $M=\frac{d R T}{P}$
2) Universal gas constant, $P, V, T: R=\frac{P V}{n T}$
3) Volume and pressure: $V_{2}=\frac{P_{2} V_{1}}{P_{1}}$
4) Volume and temperature: $V_{2}=\frac{V_{1} T_{2}}{T_{1}}$
128. An open flsk contains ait at $27^{\circ} \mathrm{C}$. At what temperature should it be heated so that $1 / 3 \mathrm{rd}$ of air present in it goes out?
(States of Matter)
1) $177^{\circ} \mathrm{C}$
2) $100^{\circ} \mathrm{C}$
3) $300^{\circ} \mathrm{C}$
4) $150^{\circ} \mathrm{C}$
129. The work done during the expansion of a gas from $4 \mathrm{dm}^{3}$ to $6 \mathrm{dm}^{3}$ against a constant external pressure of 3 atm is ( $1 \mathrm{~L} \mathrm{~atm}=101.32 \mathrm{~J}$ )
(Thermodynamics)
1)     - 6 J
2) -608 J
3) +304 J
4)     - 304 J
130. For which of the following reactions, $\mathrm{K}_{\mathrm{p}}=\mathrm{K}_{\mathrm{c}}$ ?
(Equilibrium)
1) $\mathrm{PCl}_{3(\mathrm{~g})}+\mathrm{Cl}_{2(\mathrm{~g})} \rightleftharpoons \mathrm{PCl}_{5(\mathrm{~g})}$
2) $\mathrm{H}_{2(\mathrm{~g})}+\mathrm{Cl}_{2(\mathrm{~g})} \rightleftharpoons 2 \mathrm{HCl}_{(\mathrm{g})}$
3) $\mathrm{N}_{2(\mathrm{~g})}+3 \mathrm{H}_{2(\mathrm{~g})} \rightleftharpoons 2 \mathrm{NH}_{3(\mathrm{~g})}$
4) $\mathrm{CaCO}_{3(\mathrm{~s})} \rightleftharpoons \mathrm{CaO}_{(\mathrm{s})}+\mathrm{CO}_{2(\mathrm{~g})}$
131. Oxidation number of carbon in $\mathrm{CH}_{2} \mathrm{Cl}_{2}$ is oxidation state of iron in $\mathrm{Fe}(\mathrm{CO})_{4}$ is
4) $0^{\text {(Redox Reactions) }}$
132. The element that does not show positive oxidation state is
Reactions)
1) $O$
2) $N$
3) F
4) +2
(Redox
(Hydrogen)
133. Which of the following metals does not liberate hydrogen from acids ?
1) Fe
2) Cu
3) Mg
4) Zn
134. In all oxides, peroxides and superoxides, the oxidation state of alkali metals is (S-Block elements)
1) +1 and -1
2) +1 and +2
3 ) +1 only
3) $+1,-1$ and +2
135. Aluminium oxide is not reduced by chemical reactions due to
1) Its hights stable nature 2) Its highly unstable nature 3) Its amphoteric nature 4) Its highly explosive nature
136. The shape and hybridisation of $\mathrm{BF}_{3}$ and $\mathrm{BH}_{4}^{-}$respectively are
(P-Block elements)
1) $\mathrm{BF}_{3}$ - Trigonal, $s p^{2}$ hybridisation; $\mathrm{BH}_{4}^{-}$- square planar, $s p^{3}$ hybridisation
2) $\mathrm{BF}_{3}$ - Triangular, $s p^{3}$ hybridisation; $\mathrm{BH}_{4}^{-}$- Hexagonal, $s p^{3} d$ hybridisation
3) $\mathrm{BF}_{3}$ - Trigonal, $\mathrm{sp}^{2}$ hybridisation; $\mathrm{BH}_{4}^{-}-$Tetrahedral , $\mathrm{sp}^{3}$ hybridisation
4) $\mathrm{BF}_{3}$ - Tetrahedral, $s p^{3}$ hybridisation; $\mathrm{BH}_{4}{ }^{-}$-Tetrahedral , $s p^{3}$ hybridisation
137. The IUPAC name of the compound having formula


## (Organic chemistry-some Basic Principle)

1) 3,3,3 - trimethylprop - 1 -ene
2) 1,1,1 - trimethylprop - 2 -ene
3) 3,3-dimethylbut - 1 - ene
4) 2,2-dimethylbut - 3- ene
138. Which of the following compounds will react with Na to form 4,5 -diethyloctane?
(Hydro Carbons)
1) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{Br}$
2) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2}-\mathrm{CH}-\mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{Br}$
3) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{CH}_{2}-\mathrm{CH}-\mathrm{CH}_{3}$
Br
4) 

$\mathrm{CH}_{3}$
39. Which alkane is produced when sodium salt of butanoic acid is heated with soda lime?
(Hydro Carbons)

1) $\mathrm{CH}_{3} \mathrm{CH}_{3}$
2) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{CH}_{3}$
3) $\mathrm{CH}_{4}$
4) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{3}$
140. Which of the following is not regarded as a pollutant?
(Environmental Chemistry)
1) $\mathrm{NO}_{2}$
2) $\mathrm{CO}_{2}$
3) $\mathrm{SO}_{2}$
4) CO
141. A crystal is formed by two elements $X$ and $Y$ in cubic structure. $X$ atoms are at the corners of a cube while $Y$ atoms are at the face centre. The formula of the compound will be
(Solid State)
1) $X Y$
2) $X Y_{2}$
3) $X_{2} Y_{3}$
4) $X Y_{3}$
142. The molality of 648 g of pure water is
1) 36 m
2) 55.5 m
3) 3.6 m
4) 5.55 m
(Solutions)
143. The cell reaction of the galvanic cell $\mathrm{Cu}_{(\mathrm{s})}\left|\mathrm{Cu}_{(\mathrm{aq})}^{2+} \| \mathrm{Hg}_{(\mathrm{aq})}^{2+}\right| \mathrm{Hg}_{(\ell)}$ is
(Electro Chemistry)
1) $\mathrm{Hg}+\mathrm{Cu}^{2+} \rightarrow \mathrm{Hg}^{2+}+\mathrm{Cu}$
2) $\mathrm{Hg}+\mathrm{Cu}^{2+} \rightarrow \mathrm{Cu}^{+}+\mathrm{Hg}^{+}$
3) $\mathrm{Cu}+\mathrm{Hg} \rightarrow \mathrm{CuHg}$
4) $\mathrm{Cu}+\mathrm{Hg}^{2+} \rightarrow \mathrm{Cu}^{2+}+\mathrm{Hg}$
144. The standard reduction potential for the half-cell reaction, $\mathrm{Cl}_{2}+2 \mathrm{e}^{-} \rightarrow 2 \mathrm{Cl}$ will be $\left(\mathrm{Pt}^{+2}+2 \mathrm{Cl}^{-} \rightarrow \mathrm{Pt}+\mathrm{Cl}_{2}, \mathrm{E}_{\text {cell }}^{0}=-0.15 \mathrm{~V} ; \mathrm{Pt}^{2+}+2 \mathrm{e}^{-} \rightarrow \mathrm{Pt}^{2} \mathrm{E}^{0}=1.20 \mathrm{~V}\right)$
(Electro Chemistry)
1) -1.35 V
2) +1.35 V
3) -1.05 V
4) +1.05 V
145. The rate of disappearance of $\mathrm{SO}_{2}$ in the reaction $2 \mathrm{SO}_{2}+\mathrm{O}_{2} \rightarrow 2 \mathrm{SO}_{3}$ is $1.28 \times 10^{-5} \mathrm{~mol} \mathrm{~s}^{-1}$. The rate of appearance of $\mathrm{SO}_{3}$ is
(Chemical Kinetics)
1) $0.64 \times 10^{-5} \mathrm{~mol} \mathrm{~s}^{-1}$
2) $0.32 \times 10^{-5} \mathrm{~mol} \mathrm{~s}^{-1}$
3) $2.56 \times 10^{-5} \mathrm{~mol} \mathrm{~s}^{-1}$
4) $1.28 \times 10^{-5} \mathrm{~mol} \mathrm{~s}^{-1}$
146. In a reaction $2 X \rightarrow Y$, the concentration of $X$ decreases from 3.0 moles/litre to 2.0 moles/litre in 5 minutes. The rate of reaction is
(Chemical Kinetics)
1) $0.1 \mathrm{~mol} \mathrm{~L}^{-1} \mathrm{~min}^{-1}$
2) $5 \mathrm{~mol} \mathrm{~L}^{-1} \mathrm{~min}^{-1}$
3) $1 \mathrm{~mol} \mathrm{~L}^{-1} \mathrm{~min}^{-1}$
4) $0.5 \mathrm{~mol} \mathrm{~L}^{-1} \mathrm{~min}^{-1}$
147. Which of the following is a property of Physisorption?
(Surface Chemistry)
1) High specificity
2) Irreversibility
3) Non-specificity
4) None of these
148. Which of the following is a halide ore?

Genral Principles and Process of Isolation of elements)
3) Siderite

1) Cassiterite
2) Anglesite
3) Carnallite
149. Which of the following compounds will not give ammonia on heating?
(P-Block Elements)
1) $\left(\mathrm{NH}_{4}\right)_{2} \mathrm{SO}_{4}$
2) $\left(\mathrm{NH}_{4}\right)_{2} \mathrm{CO}_{3}$
3) $\mathrm{NH}_{4} \mathrm{NO}_{2}$
4) $\mathrm{NH}_{4} \mathrm{Cl}$
150. Which of the following oxides is anhydride of nitrous acid?
1) $\mathrm{N}_{2} \mathrm{O}_{3}$
2) $\mathrm{NO}_{2}$
3) NO
4) $\mathrm{N}_{2} \mathrm{O}_{4}$
151. Which of the following transition metal ions is colourless?
1) $\mathrm{V}^{2+}$
2) $\mathrm{Cr}^{3+}$
3) $\mathrm{Zn}^{2+}$
4) $\mathrm{Ti}^{3+}$
152. A coordination compound $\mathrm{CrCl}_{3} \cdot 4 \mathrm{H}_{2} \mathrm{O}$ gives white precipitate of AgCl with $\mathrm{AgNO}_{3}$. The molar conductance of the compound corresponds to two ions. The structural formula of the compound is (Co-ordination Compounds)
1) $\left[\mathrm{Cr}\left(\mathrm{H}_{2} \mathrm{O}\right)_{4} \mathrm{Cl}_{3}\right]$
2) $\left[\mathrm{Cr}\left(\mathrm{H}_{2} \mathrm{O}\right)_{3} \mathrm{Cl}_{3}\right] \mathrm{H}_{2} \mathrm{O}$
3) $\left[\mathrm{Cr}\left(\mathrm{H}_{2} \mathrm{O}\right)_{4} \mathrm{Cl}_{2}\right] \mathrm{Cl}$
4) $\left[\mathrm{Cr}\left(\mathrm{H}_{2} \mathrm{O}\right)_{4} \mathrm{Cl}^{2} \mathrm{Cl}_{2}\right.$
153. The IUPAC name of $\left(\mathrm{CH}_{3}\right)_{2} \mathrm{CH}-\mathrm{CH}_{2}-\mathrm{CH}_{2} \mathrm{Br}$ is
(HaloAlkanes \& Halo Arenes)
3) 2-methyl-4-bromobutane 4
4) 1-bromopentane
5) 1-bromo-3-methylbutane
6) 2-methyl-4-bromobutane 4)
2an be oxidised to another com
7) 2-methyl-3-bromopropane
154. A compound $X$ with the molecular formula $\mathrm{C}_{3} \mathrm{H}_{8} \mathrm{O}$ can be oxidised to another compound $Y$ whose molecular formula is $\mathrm{C}_{3} \mathrm{H}_{6} \mathrm{O}_{2}$. The compound X may be
(Alcohols, Phenols and ethers)
1) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{OCH}_{3}$
2) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CHO}$
3) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{OH}$
4) $\mathrm{CH}_{3} \mathrm{CHOHCH} 3$
155. Propanone can be prepared from ethyne by

## (Aldehydes, Ketones \& Carboxylic acids)

1) Passing a mixture of ethyne and steam over a catalyst, magnesium at $420^{\circ} \mathrm{C}$
2) Passing a mixture of ethyne and ethanol over a catalyst zinc chromite
3) Boiling ethyne with water and $\mathrm{H}_{2} \mathrm{SO}_{4}$
4) Treating ethyne with iodine and NaOH
156. The oxidation of toluene to benzaldehyde by chromyl chloride is called (Aldehydes, Ketones \& Carboxylic acids)
1) Etard reaction
2) Riemer-Tiemann reaction
3) Wurtz reaction
4) Cannizzaro's reaction
157. Amine that cannot be prepared by Gabriel-Phthalimide synthesis is
4) iso-butylamine
5) Aniline
6) benzyl amine
7) Methyl amine
158. The general formula of carbohydrates is
1) $\mathrm{C}_{\mathrm{n}} \mathrm{H}_{2 n+1} \mathrm{O}$
2) $\mathrm{C}_{n} \mathrm{H}_{2 n} \mathrm{O}$
3) $\mathrm{C}_{x}\left(\mathrm{H}_{2} \mathrm{O}\right)_{y}$
4) $\mathrm{C}_{n}\left(\mathrm{H}_{2} \mathrm{O}\right)_{2 n}$
159. Nylon 6, 6 is obtained by condensation polymerisation of
1) Adipic acid and ethylene glycol
2) Terephthalic acid and ethylene glycol
160. Antihistamines are not helpful
1) In curing nasal allergies
2) In bringing down acute fever
3) Adipic acid and hexamethylenediamine
4) Adipic acid and phenol
(Chemistry in everyday life)
5) in treating rashes caused by itching
6) in vasodilation

## MODEL PAPER - 3

## CHEMISTRY

121. How many moles of oxygen gas can be produced during electrolytic decomposition of 180 g of water?
(Some Basic concept of chemistry)
1) 2.5 moles
2) 5 moles
3) 10 moles
4) 7 moles
122. What is the maximum number of emission lines when the excited electron of a hydrogen atom in $n=6$ drops to ground state?
1) 6
2) 15
3) 30
4) 10
123. The frequency of radiation absorbed or emitted when transition occurs between two stationary states with energies $E_{1}$ (lower) and $E_{2}$ (higher) is given by
(Structure of Atom)
1) $v=\frac{E_{1}+E_{2}}{h}$
2) $v=\frac{E_{1}-E_{2}}{h}$
3) $v=\frac{E_{1} x E_{2}}{h}$
4) $v=\frac{E_{2}-E_{1}}{h}$
124. Which of the following elements shown as pairs with their atomic numbers belong to the same period?
(Classification of elements)
1) $Z=19$ and $Z=38$
2) $Z=12$ and $Z=17$
3) $Z=11$ and $Z=21$
4) $Z=16$ and $Z=35$
125. In which of the following species the bond is non-directional?
(Chemical Bonding \& Molecular structure)
1) $\mathrm{NCl}_{3}$
2) RbCl
3) $\mathrm{BeCl}_{2}$
4) $\mathrm{BCl}_{3}$
126. The correct oder of decreasing bond lengths of $\mathrm{CO}, \mathrm{CO}_{2}$ and $\mathrm{CO}_{3}^{2-}$ is
(Chemical Bonding \& Molecular structure)
1) $\mathrm{CO}>\mathrm{CO}_{2}>\mathrm{CO}_{3}^{2-}$
2) $\mathrm{CO}_{3}^{2-}>\mathrm{CO}_{2}>\mathrm{CO}$
3) $\mathrm{CO}_{2}>\mathrm{CO}>\mathrm{CO}_{3}^{2-}$
4) $\mathrm{CO}_{2}>\mathrm{CO}_{3}^{2-}>\mathrm{CO}$
127. What volume in litres will be occupied by 4.4 g of $\mathrm{CO}_{2}$ at STP ?
(States of Matter)
1) 22.4 L
2) 44.8 L
3) 12.2 L
4) 2.24 L
128. At what temperature 28 g of N 2 will occupy a volume of 20 litres at 2 atm ?
(States of Matter)
1) 300.0 K
2) 487.2 K
3) 289.6 K
4) 283.8 K
129. What will be the change in internal energy when 12 KJ of work is done on the system and 2 Kj of heat is given by the system?
(Thermodynamics)
1) +10 kJ
2) -10 kJ
3) +5 kJ
4) -5 kJ
130. For the reaction $2 \mathrm{NO}_{2(\mathrm{~g})} \rightleftharpoons \mathrm{N}_{2} \mathrm{O}_{4(\mathrm{~g})}, \mathrm{K}_{\mathrm{p}} / \mathrm{K}_{\mathrm{c}}$ is equal to
(Equilibrium)
1) $\frac{1}{R T}$
2) $\sqrt{R T}$
3) $R T$
4) $(R T)^{2}$
131. Permanganate (VII) ion, $\mathrm{MnO}^{-4}$ oxidises I - ion to $\mathrm{T}^{2}$ and gives manganese (IV) oxide $\mathrm{MnO}_{2}$ in basic medium The skeletal ionic equation is given as $\mathrm{pMnO}_{4(\mathrm{aq)}}^{-}+\mathrm{qI}_{(\text {(aq) }}^{-}+\mathrm{xH}_{2} \mathrm{O}_{(\ell)} \rightarrow \mathrm{rMnO}_{2(\mathrm{~s})}+\mathrm{sI}_{2(\mathrm{~s})}+\mathrm{yOH}_{(\mathrm{aq})}^{-}$the values of p , $q, r$ and $s$ are
(Redox Reactions)
1) $p-1, q-2, r-8, s-4$
2) $p-2, q-6, r-2, s-3$
3) $p-2, q-4, r-2, s-8$
4) $p-1, q-4, r-8, s-2$
132. A compound contains atoms $X, Y$ and $Z$. The oxidation number of $X$ is $+2, Y$ is +5 and $Z$ is -2 , The possible formula of the compound is
(Redox Reactions)
1) $X Y Z_{2}$
2) $Y_{2}\left(X Z_{3}\right)_{2}$
3) $X_{3}\left(Y_{4}\right)_{2}$
4) $X_{3}\left(Y_{4} Z\right)_{2}$
133. Syngas is a mixture of
(Hydrogen)
1) $\mathrm{CO}_{2}+\mathrm{H}_{2}$
2) $\mathrm{CO}+\mathrm{H}_{2}$
3) $\mathrm{CO}+\mathrm{CO}_{2}$
4) $\mathrm{CO}+\mathrm{O}_{2}$
134. Which of the following has lowest thermal stability?
(S-Block elements)
1) $\mathrm{Li}_{2} \mathrm{CO}_{3}$
2) $\mathrm{Na}_{2} \mathrm{CO}_{3}$
3) $\mathrm{K}_{2} \mathrm{CO}_{3}$
135. Which of the following hydroxides is acidic?
1) $\mathrm{Al}(\mathrm{OH})_{3}$
2) $\mathrm{Ga}(\mathrm{OH})_{3}$
3) $\mathrm{Tl}(\mathrm{OH})_{3}$
136. Which of the following is not an ore of alluminium?
1) Aluminium powder
2) Zinc powder
3) Iron turnings
(P-Block elements)
137. The correct name of $\mathrm{CH}_{3} \mathrm{CH}_{2}-\mathrm{C}-\mathrm{CH}-\mathrm{CHO}$ is

II I
O CN
(Organic chemistry-some Basic Principle)

1) 2-Cyano-3-oxopentanal
2) 2 - formyl-3- oxopentanenitrile
3) 2 -cyano-1,3-pentadiene
4) 1,3-dioxo-2-cyanopentane.
138. A mixure of 1-iodoethane and 1-iodopropane is treated with sodium metal and dry ether to carry out Wurtz reaction. Which of the following hydrocarbons will be formed?
1) Propane + Hexane
2) Ethane + propane
3) Butane + Propane
4) Butane + pentane + Hexanes)
139. Which of the following is the most stable free radical?
4) $\mathrm{Rb}_{2} \mathrm{CO}_{3}$ (P-Block elements)
5) $\mathrm{B}(\mathrm{OH})_{3}$
6) copper turnings.
7) $\mathrm{CH}_{3}{ }^{\circ} \mathrm{H}_{2}$
8) $\mathrm{CH}_{3}{ }_{\mathrm{C}}^{\mathrm{C}} \mathrm{HCH}_{3}$
9) $\mathrm{CH}_{3} \stackrel{0}{\mathrm{C}} \mathrm{HC}_{6} \mathrm{H}_{5}$
10) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{CH}_{2} \stackrel{0}{\mathrm{C}} \mathrm{H}_{2}$

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140. In Antarctica,ozone depletion is due to the formation of which of the following compounds?
(Environmental Chemistry)
1) Acrolein
2) PAN
3) PCBs
4) Chlorine nitrate
141. A cubic solid is made up of two elements $P$ and $Q$ Atoms of $P$ are present at the corners of the cube and atoms of $Q$ are present at body centre. What is the formula of the compound and what are coordination numbers of $P$ and $Q$ ?
1) $P Q Q_{2}, 6: 6$
2) $P Q, 6: 6$
3) $P_{2} Q, 6: 8$
4) PQ, $8: 8$
142. When 1.04 g of $\mathrm{BaCl}_{2}$ is present in $10^{5} \mathrm{~g}$ of solution the concentration of soultion is
(Solid State)
1) 0.104 ppm
2) 10.4 ppm
3) 0.0104 ppm
4) 104 ppm
(Solutions)
143. What will be the emf of the following concentration cell at $25^{\circ} \mathrm{C}$ ?

$$
\mathrm{Ag}_{(\mathrm{s})}\left|\mathrm{AgNO}_{3}(0.01 \mathrm{M})\right|\left|\mathrm{AgNO}_{3}(0.05 \mathrm{M})\right| \mathrm{Ag}_{(\mathrm{s})}
$$

(Electro Chemistry)

1) 0.828 V
2) 0.0413 V
3) -0.0413 V
4) -0.828 V
144. What will be the reduction potential for the following half - cell reaction at 298 K ? (Given : $\left[\mathrm{Ag}^{+}\right]=0.1 \mathrm{M}$ and $\mathrm{E}_{\text {cell }}^{0}=+0.80 \mathrm{~V}$ )
(Electro Chemistry)
1) 0.741 V
2) 0.80 V
3) -0.80 V
4) -0.741 V
145. For the reaction, $2 \mathrm{~N}_{2} \mathrm{O}_{5} \rightarrow 4 \mathrm{NO}_{2}+\mathrm{O}_{2}$ rate and rate constant are $1.02 \times 10^{-4} \mathrm{~mol} \mathrm{~L}^{-1} \mathrm{~s}^{-1}$ and $3.4 \times 10^{-5} \mathrm{~s}^{-1}$ respectively. The concentration of $\mathrm{N}_{2} \mathrm{O}_{5}$ in $\mathrm{mol} \mathrm{L}^{-1}$ will be
(Chemical Kinetics)
1) $3.4 \times 10^{-4}$
2) 3.0
3) 5.2
4) $3.2 \times 10^{-5}$
146. Consider the reaction : $2 \mathrm{~N}_{2} \mathrm{O}_{4} \rightleftharpoons 4 \mathrm{NO}_{2}$ If $-\frac{\mathrm{d}\left[\mathrm{N}_{2} \mathrm{O}_{4}\right]}{\mathrm{dt}}=k$ and $\frac{\mathrm{d}\left[\mathrm{NO}_{2}\right]}{\mathrm{dt}}=\mathrm{k}^{\prime}$ then
(Chemical Kinetics)
1) $2 \mathrm{k}^{\prime}=\mathrm{k}$
2) $\mathrm{k}^{\prime}=2 \mathrm{k}$
3) $k^{\prime}=k$
4) $k=\frac{1}{4} k^{\prime}$
147. Which of the following gases is least adsorbed on charcoal?
(Surface Chemistry)
1) HCl
2) $\mathrm{NH}_{3}$
3) $\mathrm{O}_{2}$
4) $\mathrm{CO}_{2}$
148. Froth floatation processs of concentration is based on the
(Genral Principles and Process of Isolation of elements)
1) Preferential wetting properties with the frothing agent and water
2) Difference in the specific gravities of gangue and ore particles
3) Difference in solubility of gangue and ore particles in frothing agent and water
4) Difference in reactivity of gangue and ore particles with water and frothing agent.
149. $\mathrm{PCl}_{3}$ on hydrolysis gives
2) $\mathrm{HPO}_{3}$
3) $\mathrm{H}_{3} \mathrm{PO}_{4}$
4) $\mathrm{POCl}_{3}$
150. Arrange the following in decreasing Lewis acid strength $-\mathrm{PF}_{3}, \mathrm{PCl}_{3}, \mathrm{PBr}_{3}, \mathrm{PI}_{3}$. (P-Block Elements)
1) $\mathrm{PI}_{3}>\mathrm{PBr}_{3}>\mathrm{PCl}_{3}>\mathrm{PF}_{3}$
2) $\mathrm{PF}_{3}>\mathrm{PCl}_{3}>\mathrm{PBr}_{3}>\mathrm{PI}_{3}$
3) $\mathrm{PCl}_{3}>\mathrm{PBr}_{3}>\mathrm{Pl}_{3}>\mathrm{PF}_{3}$
4) $\mathrm{PBr}_{3}>\mathrm{PI}_{3}>\mathrm{PF}_{3}>\mathrm{PCl}_{3}$
151. The correct order of number of unpaired electrons is
( $d$ - and-f-block elements)
1) $\mathrm{Cu}^{2+}>\mathrm{Ni}^{2+}>\mathrm{Cr}^{3+}>\mathrm{Fe}^{3+}$
2) $\mathrm{Ni}^{2+}>\mathrm{Cu}^{2+}>\mathrm{Fe}^{3+}>\mathrm{Cr}^{3+}$
3) $\mathrm{Fe}^{3+}>\mathrm{Cr}^{3+}>\mathrm{Ni}^{2+}>\mathrm{Cu}^{2+}$
4) $\mathrm{Cr}^{2+}>\mathrm{Fe}^{3+} \gg \mathrm{Ni}^{2+}>\mathrm{Cu}^{2+}$
152. The charges $x$ and $y$ on the following ions are (i) $\left[\mathrm{Co}\left(\mathrm{NH}_{3}\right)_{2} \mathrm{Cl}_{4}\right]^{x}$
(ii) $\left[\mathrm{Fe}(\mathrm{CN})_{6}\right]^{y}\left(\begin{array}{l}\text { (Oxidation state of } \mathrm{Co} \text { is }+3 \\ \text { (Co-ordination Compounds) }\end{array}\right.$ and Fe is +2 in their respective complexes.)
3) $x=-1, y=-4$
4) $x=-2, y=-3$
153. The negative part of the addendum (The molecule to be added) adds on to the carbon atom of the double bond conatining the least number of hydrogen atoms. This rule is known as (HaloAlkanes \& Halo Arenes)
1) Saytzeff's rule
2) Peroxide rule
3) markovnikov's rule 4) van't Hoff rule
154. What happens when tertiary butyl alcohol is passed over heated copper at $300^{\circ} \mathrm{C}$ ? (Alcohols, Phenols and ethers)
1) Secondary butyl alcohol is formed
2) 2-Methylpropene is formed
3) 1 - Butene is formed
4) Butanal is formed.
155. The addition of HCN to carbonyl compounds is an example of
(Aldehydes, Ketones \& Carboxylic acids)
1) nucleophilic addition
2) electrophilic addition
3) Free radical addition
4) electromeric addition
156. Aldehydes other than formaldehyde react with Grignard's reagent to give addition products which on hydrolysis give
(Aldehydes, Ketones \& Carboxylic acids)
1) Tertiary alcohols
2) secondary alcohols
3) primary alcohols
4) Carboxylic acids
157. Arrange the following in increasing order of basicity: $\mathrm{CH}_{3} \mathrm{NH}_{2},\left(\mathrm{CH}_{3}\right)_{2} \mathrm{NH}, \mathrm{NH}_{3}, \mathrm{C}_{6} \mathrm{H}_{5} \mathrm{NH}_{2}$
(Amines)
1) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{NH}_{2}<\mathrm{NH}_{3}<\left(\mathrm{CH}_{3}\right)_{2} \mathrm{NH}<\mathrm{CH}_{3} \mathrm{NH}_{2}$
2) $\mathrm{CH}_{3} \mathrm{NH}_{2}<\left(\mathrm{CH}_{3}\right)_{2} \mathrm{NH}<\mathrm{NH}_{3}<\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{NH}_{2}$
3) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{NH}_{2}<\mathrm{NH}_{3}<\mathrm{CH}_{3} \mathrm{NH}_{2}<\left(\mathrm{CH}_{3}\right)_{2} \mathrm{NH}$
4) $\left(\mathrm{CH}_{3}\right)_{2} \stackrel{2}{\mathrm{~N}} \mathrm{H}<\mathrm{CH}_{3} \mathrm{NH}_{2}<\mathrm{NH}_{3}<\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{NH}_{2}$
158. What are the hydrolysis products of sucrose?
3) Glucose + Galaitose 4) Glucose + Fructose
4) Fructose + Fructose 2) Glucose + Glucose
159. Natural rubber is a polymer of
2) 2 methyl-1, 3-butadiene
3) 1, 1-dimethylbutadiene
4) 2 - chlorobut - 2 - ene
160. The chemical substances used to bring down body temperature in high fever are known as
(Chemistry in everyday life)
1) Analgesics
2) Antipyretics
3) Antihistamines
4) Tranquilizers

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## MODEL PAPER - 4

## CHEMISTRY

121. 1 mole of water contains
(Some Basic concept of chemistry)
1) $6.023 \times 10^{23}$ atoms
2) $6.023 \times 10^{23}$,molecules 3) $3 \times 6.023 \times 10^{23}$ molecules 4$)$
3) None of these
122. What is the velocity of electron present in first Bohr orbit of hydrogen atom?
(Structure of Atom)
1) $2.18 \times 10^{5} \mathrm{~m} / \mathrm{s}$
2) $2.18 \times 10^{6} \mathrm{~m} / \mathrm{s}$
3) $2.18 \times 10^{-18} \mathrm{~m} / \mathrm{s}$
4) $2.18 \times 10^{-9} \mathrm{~m} / \mathrm{s}$
123. According to Bohr's theory, the angular momentum of an electron in 5 th orbit is
(Structure of Atom)
1) $\frac{10 \mathrm{~h}}{\pi}$
2) $\frac{25 h}{\pi}$
3) $\frac{1.5 \mathrm{~h}}{\pi}$
4) $\frac{2.5 h}{\pi}$
124. An element has atomic number 79. Predict the group and period in which the element is placed.
(Classification of elements)
1) $2^{\text {nd }}$ group, $7^{\text {th }}$ period
2) $11^{\text {th }}$ group, $6^{\text {th }}$ period 3$) 13^{\text {th }}$ group, $6^{\text {th }}$ period
3) $12^{\text {th }}$ group, $6^{\text {th }}$ period
125. The correct sequence of bond length in single bond, double bond and triple bond of C is
(Chemical Bonding \& Molecular structure)
1) $(\mathrm{C}-\mathrm{C})<(\mathrm{C}=\mathrm{C})<(\mathrm{C} \equiv \mathrm{C})$
2) $\mathrm{C} \equiv \mathrm{C}<\mathrm{C}=\mathrm{C}<\mathrm{C}-\mathrm{C}$
3) $\mathrm{C}-\mathrm{C}<\mathrm{C}=\mathrm{C}<\mathrm{C} \equiv \mathrm{C}$
4) $\mathrm{C}=\mathrm{C}<\mathrm{C} \equiv \mathrm{C}<\mathrm{C}-\mathrm{C}$
126. Arrange the following in increasing order of covalent character - $\mathrm{NaCl}, \mathrm{MgCl}_{2}, \mathrm{AlCl}_{3}$.
(Chemical Bonding \& Molecular

## structure)

1) $\mathrm{NaCl}<\mathrm{MgCl}_{2}<\mathrm{AlCl}_{3}$
2) $\mathrm{MgCl}_{2}<\mathrm{NaCl}<\mathrm{AlCl}_{3}$
3) $\mathrm{AlCl}_{3}<\mathrm{MgCl}_{2}<\mathrm{NaCl}$
4) $\mathrm{NaCl}<\mathrm{AlCl}_{3}<\mathrm{MgCl}_{2}$
127. What is the density of $\mathrm{CO}_{2}$ at $27^{\circ} \mathrm{C}$ and 2.5 atm pressure ?
(States of Matter)
1) $5.2 \mathrm{~g} \mathrm{~L}^{-1}$
2) $6.2 \mathrm{~g} \mathrm{~L}^{-1}$
3) $7.3 \mathrm{~g} \mathrm{~L}^{-1}$
4) $4.46 \mathrm{~g} \mathrm{~L}^{-1}$
128. Molecular mass of a gas is 78 . Its density at $98^{\circ} \mathrm{C}$ and 1 am will be
(States of Matter)
1) $200 \mathrm{~g} \mathrm{~L}^{-1}$
2) $2.56 \mathrm{~g} \mathrm{~L}^{-1}$
3) $256 \mathrm{~g} \mathrm{~L}^{-1}$
4) $78 \mathrm{~g} \mathrm{~L}^{-1}$
129. A reaction proceeds through two paths I and II to convert $X \rightarrow Z$.


What is the correct relationship between $\mathrm{Q}, \mathrm{Q}_{1}$ and $\mathrm{Q}_{2}$ ?
(Thermodynamics)

1) $Q=Q_{1} \times Q_{2}$
2) $Q=Q_{1}+Q_{2}$
3) $Q=Q_{2}-Q_{1}$
4) $Q=Q_{1} / Q_{2}$
130. For the reaction $\mathrm{a}+\mathrm{b} \rightleftharpoons \mathrm{c}+\mathrm{d}$, initially concentrations of a and b are equal and at equilibrium the concentration of $d$ will be twice of that of $a$. What will be the equilibrium constant for the reaction? (Equilibrium)
1) 2
2) 9
3) 4
4) 3
131. Write the stoichiometric coefficient for the following reaction:

$$
\mathrm{xI}_{2}+\mathrm{yOH}^{-} \rightarrow \mathrm{IO}_{3}^{-}+\mathrm{zI}^{-}+3 \mathrm{H}_{2} \mathrm{O}
$$

(Redox Reactions)

1) $x-6, y-3, z-5$
2) $x-3, y-2, z-3$
3) $x-3, y-6, z-5$
4) $x-3, y-3, z-3$
132. Which compound amongst the following has the highest oxidation number of Mn ? (Redox Reactions)
1) $\mathrm{KMnO}_{4}$
2) $\mathrm{K}_{2} \mathrm{MnO}_{4}$
3) $\mathrm{MnO}_{2}$
4) $\mathrm{Mn}_{2} \mathrm{O}_{3}$
133. Which property of Hydrogen is shown by the following reactions?
(Hydrogen)
i) $\mathrm{Fe}_{3} \mathrm{O}_{4}+4 \mathrm{H}_{2} \rightarrow 3 \mathrm{Fe}+4 \mathrm{H}_{2} \mathrm{O}$
ii) $\mathrm{CO}+\mathrm{H}_{2} \xrightarrow[\mathrm{Cr}_{2} \mathrm{O}_{3}]{\mathrm{ZnO}} \mathrm{CH}_{3} \mathrm{OH}$
1) Reducing character
2) Oxidising character
3) Combustibility
4) High reactivity
134. Baking soda is
(S-Block elements)
1) $\mathrm{NaHCO}_{3}$
2) $\mathrm{NaHCO}_{3}, 6 \mathrm{H}_{2} \mathrm{O} \quad$ 3) $\mathrm{Na}_{2} \mathrm{CO}_{3}$
3) $\mathrm{Na}_{2} \mathrm{CO}_{3}, 10 \mathrm{H}_{2} \mathrm{O}$
135. $\mathrm{Na}_{2} \mathrm{~B}_{4} \mathrm{O}_{7}+\mathrm{X} \rightarrow \mathrm{H}_{3} \mathrm{BO}_{3}$. What is X in the reaction?
(P-Block elements)
1) Aqueous solution of NaOH 2) Dilute nitric acid 3) Conc. $\mathrm{H}_{2} \mathrm{SO}_{4}$ or HCl 4) water
136. Which of the following compounds is formed in borax bead test?
(P-Block elements)
1) Metaborate
2) Tetraborate
3) Triborate
4) Orthoborate
137. Which of the following represents 3 -methylpenta-1,3-diene?

## (Organic chemistry-some Basic Principle)

1) $\mathrm{CH}_{2}=\mathrm{CH}\left(\mathrm{CH}_{2}\right)_{2} \mathrm{CH}_{3}$
2) $\mathrm{CH}_{2}=\mathrm{CHCH}\left(\mathrm{CH}_{3}\right) \mathrm{CH}_{2} \mathrm{CH}_{3}$
3) $\mathrm{CH}_{3} \mathrm{CH}=\mathrm{C}\left(\mathrm{CH}_{3}\right) \mathrm{CH}=\mathrm{CH}_{2}$
4) $\mathrm{CH}_{3} \mathrm{CH}=\mathrm{C}\left(\mathrm{CH}_{3}\right)_{2}$
138. Chlorination of methane does not occur in dark because
(Hydro Carbons)
1) Methane can form free radicals in presence of sunlight only
2) To get chlorine free radicals from $\mathrm{Cl}_{2}$ molecules energy is required. It cannot happen in dark
3) Substitution reaction can take place only in sunlight and not in dark
4) Termination step cannot take place in dark. It requires sunlight.
139. Presence of unsaturation in organic compounds can be tested with
(Hydro Carbons)
1) Fehling's reagent
2) Tollen's reagent
3) Baeyer's reagent
4) Fittig's reaction
140. Freon's are not recommended to be used in regfrigerators because they
(Environmental Chemistry)
1) Cause global warming
2) Cause acid rain
3) Cause depletion of ozone layer
4) Cause very less cooling.
141. How many chloride ions are surrounding sodium ion in sodium chloride crystal?
(Solid State)
1) 4
2) 8
3) 6
4) 12
142. The density of a solution prepared by dissolving 120 g of urea (mol. mass $=60 \mathrm{u}$ ) in 1000 g of water is $1.15 \mathrm{~g} /$ mL . The molarity of this solution is
(Solutions)
1) 1.78 M
2) 1.02 M
3) 2.05 M
4) 0.50 M
143. Limiting molar conductivity for some ions is given below (in $\mathrm{Scm}^{2} \mathrm{~mol}^{-1}$ ): $\mathrm{Na}^{+}-50.1, \mathrm{Cl}^{-}-763, \mathrm{H}^{+}-349.6 \mathrm{CH}_{3} \mathrm{COO}^{-}-40.9, \mathrm{Ca}^{2+}-119.0$.
What will be the limiting molar conductivities ( $\Lambda^{0}{ }_{\mathrm{m}}$ ) of $\mathrm{CaCl}_{2}, \mathrm{CH}_{3} \mathrm{COONa}$ and NaCl respectively?
(Electro Chemistry)
1) $97.65,111.0$ and $242.8 \mathrm{~S} \mathrm{~cm}^{2} \mathrm{~mol}^{-1}$
2) $195.3,182.0$ and $26.2 \mathrm{~S} \mathrm{~cm}^{2} \mathrm{~mol}^{-1}$
3) $271.6,91.0$ and $126.4 \mathrm{~S} \mathrm{~cm}^{2} \mathrm{~mol}^{-1}$
4) $119.0,1024.5$ and $9.2 \mathrm{~S} \mathrm{~cm}^{2} \mathrm{~mol}^{-1}$
144. The equivalent conductivity of $\mathrm{N} / 10$ solution of acetic acid at $25^{\circ} \mathrm{C}$ is $14.3 \mathrm{ohm}^{-1} \mathrm{~cm}^{2}$ equiv ${ }^{-1}$. what will be the degree of dissociation of acetic acid ? $\left(\Lambda_{\propto \mathrm{CH}}^{3} \mathrm{COOH}=390.71 \mathrm{ohm}^{-1} \mathrm{~cm}^{2}\right.$ equiv $\left.^{-1}\right)$
(Electro Chemistry)
1) $3.66 \%$
2) $3.9 \%$
3) $2.12 \%$
4) $0.008 \%$
145. The rate constant of a reaction depends upon
2) extent of the reaction
3) Temperature of the reaction
4) The time of completion of reaction.
146. The chemical reaction, $2 \mathrm{O}_{3} \rightarrow 3 \mathrm{O}_{2}$ proceeds as $\mathrm{O}_{3} \rightleftharpoons \mathrm{O}_{2}+[\mathrm{O}]$ (fast) $[\mathrm{O}]+\mathrm{O}_{3} \rightarrow 2 \mathrm{O}_{2} \quad$ (slow) The rate law expression will be $\quad$ (Chemical Kinetics)
1) Rate $=k[O]\left[O_{3}\right]$
2) Rate $=k\left[\mathrm{O}_{3}\right]^{2}\left[\mathrm{O}_{2}\right]^{-1}$
3) Rate $=k\left[\mathrm{O}_{3}\right]^{2}$
4) Rate $=k\left[\mathrm{O}_{2}\right][\mathrm{O}]$
147. In Freundlich adsorption equation $x / m=k p^{1 / n}$, the value of $n$ is
(Surface Chemistry)
1) Alwyas grater than one
2) Always smaller
3) Always equal to one
4) Greater than one at low temperature and smaller than one at high temperature.
148. Sulphide ore of zinc / copper is concentrated by (Genral Principles and Process of Isolation of elements)
1) Floatation process
2) electromagnetic proces
3) gravity separation 4) distillation.
149. How many P-O-P bonds appear in cyclic meta - phosphoric acid ?
(P-Block Elements)
1) Four
2) Three
3) Two
4) One
150. Which of the following is not correctly matched ?
(P-Block Elements)
1) $\mathrm{PCl}_{5}-s p^{3} d$ hybridisation
2) $\mathrm{PCl}_{3}-s p^{3}$ hybridisation
3) $\mathrm{PCl}_{5}$ (solid) $-\left[\mathrm{PtCl}_{4}\right]^{+}\left[\mathrm{PtCl}_{6}\right]$
4) $\mathrm{H}_{3} \mathrm{PO}_{3}$ - tribasic
151. The magnetic moment of a divalent ion in aqueous solution with atomic number 25 is
(d-and-f-block elements)
1) 5.9 B.M
2) $2.9 \mathrm{~B} . \mathrm{M}$
3) $6.9 \mathrm{~B} . \mathrm{M}$
4) 9.9 B.M
152. Among the following which are ambidentate ligands?
(i) $\mathrm{SCN}^{-}$
(ii) $\mathrm{NO}_{3}^{-}$
(iii) $\mathrm{NO}_{2}^{-}$
(iv) $\mathrm{C}_{2} \mathrm{O}^{2-}$
1) (i) and (iii)
2) (i) and (iv)
3) (ii) and (iii)
(Co-ordination Compounds)
153. Which of the following reactions follows Markovnikov's rule?
4) (ii) and (iv)
5) $\mathrm{C}_{2} \mathrm{H}_{4}+\mathrm{HBr}$
6) $\mathrm{C}_{3} \mathrm{H}_{6}+\mathrm{Cl}_{2}$
7) $\mathrm{C}_{3} \mathrm{H}_{6}+\mathrm{HBr}$
(HaloAlkanes \& Halo Arenes)
154. An alcohol $x$ when treated with hot conc. $\mathrm{H}_{2} \mathrm{SO}_{4}$ gave an alkene $y$ with formula $\mathrm{C}_{4} \mathrm{H}_{8}$. This alkene on ozonlysis gives single product with molecular formula $\mathrm{C}_{2} \mathrm{H}_{4} \mathrm{O}$. The alcohol is
(Alcohols, Phenols and ethers)
1) butan - 1-0l
2) butan-2-ol
3) 2 - methylpropan - 1 -ol
4) 2,2-dimethylbutan - 1-ol
155. Which of the following compounds will undergo cannizzaro reaction ? (Aldehydes, Ketones \& Carboxylic acids)
1) $\mathrm{CH}_{3} \mathrm{CHO}$
2) $\mathrm{CH}_{3} \mathrm{COCH}_{3}$
3) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{CHO}$
4) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{CH}_{2} \mathrm{CHO}$
156. Match the column I with column II and mark the appropriate choice.
column I
(A) Clemmensen reduction
(B) Rosenmund reduction
(C) lodoform reaction
(D) Cannizzaro reaction
column II
(i) Conc, KOH
(ii) $\mathrm{Zn} / \mathrm{Hg}+$ conc. HCl
(iii) $\mathrm{H}_{2} / \mathrm{Pd}-\mathrm{BaSO}_{4}$
(iv) $\mathrm{NaOH}+\mathrm{I}_{2}$
(Aldehydes, Ketones \& Carboxylic acids)
1) $(\mathrm{A}) \rightarrow$ (i), (B) $\rightarrow$ (iii), (C) $\rightarrow$ (ii), (D) $\rightarrow$ (iv)
2) $(\mathrm{A}) \rightarrow$ (iii), (B) $\rightarrow$ (iv), (C) $\rightarrow$ (i), (D) $\rightarrow$ (ii)
3) $(\mathrm{A}) \rightarrow$ (ii), (B) $\rightarrow$ (iii), (C) $\rightarrow$ (iv), (D) $\rightarrow$ (i)
4) $(\mathrm{A}) \rightarrow$ (iv), (B) $\rightarrow$ (i), (C) $\rightarrow$ (ii), (D) $\rightarrow$ (iii)
157. Electrophilic substitution of aniline with bromine - water at room temperature gives
(Amines)
1) 2 - bromoaniline
2) 3 - bromoaniline
3) 2,4,6 - tribromoaniline
4) 3,5,6 - tribromoaniline
158. Denaturation of protein leads to loss of its biological activity by
(Bio Molecules)
1) Formation of amino acids
2) Loss of primary structure
3) Loss of both primary and secondary structure


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## MODEL PAPER -5

## CHEMISTRY

121. A compound contains two elements ' $X$ ' and ' $Y$ ' in the ratio of $50 \%$ each. Atomic mass of ' $X$ ' is 20 and ' $Y$ ' is 40 . What can be its simplest formula ?
(Some Basic concept of chemistry)
1) $X Y$
2) $X_{2} Y$
3) $X Y_{2}$
4) $X_{2} Y_{3}$
122. If the radius of first Bohr's orbit is $x$ pm, then the radius of the third orbit would be
(Structure of Atom)
1) $(3 \times x) p m$
2) $(6 x x) p m$
3) $\left(\frac{1}{2} \times x\right) p m$
4) $(9 \mathrm{xx}) \mathrm{pm}$
123. If the ionisation energy of hydrogen atom is 13.6 eV , the energy required to excite it from ground state to the next higher state is approximately
(Structure of Atom)
1) 3.4 eV
2) 10.2 eV
3) 17.2 eV
4) 13.6 eV
124. An element has the electronic configuration $1 s^{2} 2 s^{2} 2 p^{6} 3 s^{2} 3 p^{6} 3 d^{8} 4 s^{2}$. what will be its position in the periodic table?
(Classification of elements)
1) Period 4, Group 10
2) Period 2 , group 2
3) period 4, Group 2
4) Period 2, Group 8
125. What is common between the following molecules: $\mathrm{SO}_{3}, \mathrm{CO}_{3}^{2-}, \mathrm{NO}_{3}^{-}$?
(Chemical Bonding \& Molecular

## structure)

1) All have linear shape.
2) All have trigonal planar shape
3) All have tetrahedral shape
4) All have trigonal pyramidal shape.
126. Which of the following does not show octahedral geometry?
(Chemical Bonding \& Molecular structure)
1) $\mathrm{SF}_{6}$
2) $\mathrm{IF}_{5}$
3) $\mathrm{SiF}^{2-}$
4) $\mathrm{SF}_{4}$
127. Which of the following relationships between partial pressure, volume and temperature is correct? (States of Matter)
i) $P=\frac{n R T}{V}$
ii) $P_{\text {total }}=P_{1}+P_{2}+P_{3}$
iii) $P_{\text {total }}=\left(n_{1}+n_{2}+n_{3}\right) \frac{R T}{V}$
1) i and ii
2) i and iii
3) ii and iii
4) i, ii and iii
128. Density of a gas is found to be $5.46 \mathrm{~g} / \mathrm{dm}^{3}$ at $27^{\circ} \mathrm{C}$ and 2 bar pressure. What will be its denisty at STP?
(States of Matter)
1) $3.0 \mathrm{~g} \mathrm{dm}^{-3}$
2) $5.0 \mathrm{~g} \mathrm{dm}^{-3}$
3) $6.0 \mathrm{~g} \mathrm{dm}^{-3}$
4) $10.82 \mathrm{~g} \mathrm{dm}^{-3}$
129. Which of the following expressions is correct to calculate enthalpy of a reaction?
(Thermodynamics)
1) $\Delta \mathrm{H}_{\text {reaction }}=\sum \Delta_{t} \mathrm{H}_{\text {reactants }}-\sum \Delta_{t} \mathrm{H}_{\text {products }}$
2) $\Delta \mathrm{H}_{\text {reaction }}=\sum B E$
$E_{\text {products }}$ -
$-\sum B . E_{\text {reactants }}$
3) $\Delta \mathrm{H}_{\text {reaction }}=\sum B E_{\text {reactants }}-\sum B . E_{\text {products }}$
4) $\Delta \mathrm{H}_{\text {reaction }}=\Delta \mathrm{H}_{1} \times \Delta \mathrm{H}_{2} \times \Delta \mathrm{H}_{3}$
130. Predict the direction of the reaction from the comparison of $Q_{C}$ and $K_{C}$. Mark the incorrect statement.

(Equilibrium)
1) If $Q_{C}<K_{C}$ reaction goes from left to right
2) If $Q_{C}=K_{C}$ reaction goes form right to left
3) If $Q_{C}>K_{C}$ net reaction goes from right to left
4) If $Q_{C}=K_{c}$ reactants and products are at equilibrium
131. In which of the following compounds oxidation state of chlorine has two different values?
(Redox Reactions)
1) $\mathrm{CaCl}_{2}$
2) NaCl
3) $\mathrm{CaOCl}_{2}$
4) $\mathrm{CCl}_{4}$
132. The values of coefficients to balance the following reaction are
(Redox Reactions)

|  | $\mathrm{Cr}(\mathrm{OH})_{3}+\mathrm{ClO}^{-}+\mathrm{OH}^{-} \rightarrow \mathrm{CrO}_{4}{ }^{2-}+\mathrm{Cl}^{-}+\mathrm{H}_{2} \mathrm{O} \rightarrow$ |  |  |  |
| :--- | :---: | :---: | :---: | :---: |
| $\mathrm{Cr}(\mathrm{OH})_{3}$ | $\mathrm{CrO}_{4}{ }^{2-}$ | $\mathrm{Cl}^{-}$ |  |  |
| 1) | 2 | 3 | 3 | 3 |
| 2) | 2 | 4 | 3 | 2 |
| $3)$ | 2 | 4 | 4 | 2 |
| $4)$ | 2 | 3 | 2 | 3 |

133. Which of the following hydrides is electron deficient?
(Hydrogen)
1) NaH
2) $\mathrm{CaH}_{2}$
3) $\mathrm{CH}_{4}$
4) $\mathrm{B}_{2} \mathrm{H}_{6}$
134. A white solid $X$ reacts with dil. $\mathrm{HCl}^{2}$ to give colourless gas which is used in fire extinguishers. The solid X is
(S-Block elements)
1) NaCl
2) $\mathrm{CH}_{3} \mathrm{COONa}$
3) $\mathrm{Na}_{2} \mathrm{CO}_{3}$
4) $\mathrm{NaHCO}_{3}$
135. Identify $X$ and $Y$ in the following reaction $\mathrm{BCl}_{3}+\mathrm{NH}_{4} \mathrm{Cl} \xrightarrow[C_{6} \mathrm{H}_{5} \mathrm{Cl}]{14{ }^{\circ} \mathrm{C}} X \xrightarrow{\mathrm{NaBH}_{4}} Y$
(P-Block elements)
1) $X=\mathrm{NaBO}_{2}, Y=\mathrm{B}_{2} \mathrm{O}_{3}$
2) $X=\mathrm{Na}_{2} \mathrm{~B}_{4} \mathrm{O}_{7}, Y=\mathrm{H}_{3} \mathrm{BO}_{3}$
3) $\mathrm{X}=\mathrm{BN}, \mathrm{Y}^{2}=\left[\mathrm{NH}_{4}\right]^{+}\left[\mathrm{BCl}_{4}\right]^{-}$
4) $X=B_{3} \mathrm{~N}_{3} \mathrm{H}_{3} \mathrm{Cl}_{3}, Y=\mathrm{B}_{3} \mathrm{~N}_{3} \mathrm{H}_{6}$
136. The type of hybridization of boron in diborane is
(P-Block elements)
1) sp-hybridization
2) $s p^{2}$-hybridization
3) $\mathrm{sp}^{3}$-hybridization
4) $s p^{3} d^{2}$-hybridization
 and $\mathrm{C}_{2} \mathrm{H}_{5}-\mathrm{O}-\mathrm{N}=\mathrm{O}$ are example of
(Organic chemistry-some Basic Principle)
5) Functional isomers
6) Tautomers
7) Position isomers
8) metamers
138. Propanal -1 and pentan -3-- one are the ozonolysis products of an alkene. What is the structural formula of alkene?
(Hydro Carbons)
1) 


2)

3)

4) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{CH}_{2}-\mathrm{CH}=\mathrm{CH}-\mathrm{CH}_{2} \mathrm{CH}_{3}$
139. What are the products of dehydrohalogenation of 2-iodopentane ?
(Hydro Carbons)

1) 2 - Pentene (major) - 1-Pentene(minor)
2) 1-pentene (major), 2 - pentene (minor)
3) 2 - pentene ( $50 \%$ ), 1-pentene ( $50 \%$ )
4) None of these.
140. Carbon monoxide is harmful to human beings as it
(Environmental Chemistry)
1) Is carcinogenic
2) Is antagonistic to $\mathrm{CO}_{2}$
3) Has higher affinity for haemoglobin as compared to oxygen
4) Is destructive to $\mathrm{CO}_{2}$
141. A metal crystallise into a lattice containing a sequence of layers as $A B A B A B$ $\qquad$ What percentage of voids are left in the lattice?
(Solid State)
1) $72 \%$
2) $48 \%$
3) $26 \%$
4) $32 \%$
142. Which of the following solutions shows positive deviation from Raoult's law ? (Solutions)
1) Acetone + Aniline
2) Acetone + Ethanol
3) Water + Nitric acid
4) Chloroform + Benzene
143. Limiting molar conductivity of NaBr is
(Electro Chemistry)
1) $\Lambda_{\mathrm{m}}^{\circ} \mathrm{NaBr}=\Lambda_{\mathrm{m}}^{\circ} \mathrm{NaCl}+\Lambda_{\mathrm{m}}^{\circ} \mathrm{KBr}$
2) $\Lambda_{\mathrm{m}}^{\circ} \mathrm{NaBr}=\Lambda_{\mathrm{m}}^{\circ} \mathrm{NaCl}+\Lambda_{\mathrm{m}}^{\circ} \mathrm{KBr}-\Lambda_{\mathrm{m}}^{\circ} \mathrm{KCl}$
3) $\Lambda_{\mathrm{m}}^{\circ} \mathrm{NaBr}=\Lambda_{\mathrm{m}}^{\circ} \mathrm{NaOH}+\Lambda_{\mathrm{m}}^{\circ} \mathrm{NaBr}-\Lambda_{\mathrm{m}}^{\circ} \mathrm{NaCl}$
4) $\Lambda_{\mathrm{m}}^{\circ} \mathrm{NaBr}=\Lambda_{\mathrm{m}}^{\circ} \mathrm{NaCl}-\Lambda_{\mathrm{m}}^{\circ} \mathrm{NaBr}$
144. The equivalent conductance of $\mathrm{Ba}^{2+}$ and $\mathrm{Cl}^{-}$are respectively 127 and $76 \mathrm{ohm}^{-1} \mathrm{~cm}^{2} \mathrm{eq}^{-1}$ at infinite dilution. What will be the equivalent conductance of $\mathrm{BaCl}_{2}$ at infinite dilution ?
(Electro Chemistry)
1) $139.5 \mathrm{ohm}^{-1} \mathrm{~cm}^{2} \mathrm{eq}^{-1}$
2) $203 \mathrm{ohm}^{-1} \mathrm{~cm}^{2} \mathrm{eq}^{-1}$
3) $279 \mathrm{ohm}^{-1} \mathrm{~cm}^{2} \mathrm{eq}^{-1}$
4) $101.5 \mathrm{ohm}^{-1} \mathrm{~cm}^{2} \mathrm{eq}^{-1}$
145. Half - Life period of a first order reaction is 10 min what percentage of the reaction will be completed in 100 min?
(Chemical Kinetics)
1) $25 \%$
2) $50 \%$
3) $99.9 \%$
4) $75 \%$
146. What will be the half - life of the first order reaction for which the value of rate constant is $200 \mathrm{~s}^{-1}$ ?
(Chemical Kinetics)
1) $3.46 \times 10^{-2} \mathrm{~s}$
2) $3.46 \times 10^{-3} \mathrm{~s}$
3) $4.26 \times 10^{-2} \mathrm{~s}$
4) $4.26 \times 10^{-3} \mathrm{~s}$
(Surface Chemistry)
147. Which of the following graphs would yield a straight line?
1) $x / m$ vs $p$
2) $\log x / m$ vs $p$
3) $x / m$ vs $\log p$
4) $\log x / m$ vs $\log p$
148. Which of the following reactions show the process of smelting?
(Genral Principles and Process of Isolation of elements)
1) $2 \mathrm{PbO}+\mathrm{Pbs} \rightarrow 3 \mathrm{~Pb}+\mathrm{So}_{2}$
2) $2 \mathrm{Na}\left[\mathrm{Au}(\mathrm{CN})_{2}\right]+\mathrm{Zn} \rightarrow \mathrm{Na}_{2}\left[\mathrm{Zn}(\mathrm{CN})_{4}\right]+2 \mathrm{Au}$
3) $\mathrm{PbO}+\mathrm{C} \rightarrow \mathrm{Pb}+\mathrm{CO}$
4) $2 \mathrm{HgS}+3 \mathrm{O}_{2} \rightarrow 2 \mathrm{HgO}+2 \mathrm{SO}_{2}$
149. Arrange the following hydrides of group 16 elements in order of increasing stability.
(P-Block Elements)
1) $\mathrm{H}_{2} \mathrm{~S}<\mathrm{H}_{2} \mathrm{O}<\mathrm{H}_{2} \mathrm{Te}>\mathrm{H}_{2} \mathrm{Se}$
2) $\mathrm{H}_{2} \mathrm{O}<\mathrm{H}_{2} \mathrm{Te}<\mathrm{H}_{2} \mathrm{Se}<\mathrm{H}_{2} \mathrm{~S}$
3) $\mathrm{H}_{2} \mathrm{O}<\mathrm{H}_{2} \mathrm{~S}<\mathrm{H}_{2} \mathrm{Se}<\mathrm{H}_{2} \mathrm{Te}$
4) $\mathrm{H}_{2} \mathrm{Te}<\mathrm{H}_{2} \mathrm{Se}<\mathrm{H}_{2} \mathrm{~S}<\mathrm{H}_{2} \mathrm{O}$
150. Bond angle in $\mathrm{H}_{2} \mathrm{O}\left(104.5^{0}\right)$ is higher than the bond angle of $\mathrm{H}_{2} \mathrm{~S}\left(92.1^{0}\right)$. The difference is due to

$\qquad$ (P-Block Elements)
1) Difference in size of $S$ and $O$
2) Difference in electronegativity of $S$ and $O$
3) Difference in Oxidation states of $S$ and $O$
4) Difference in shapes of hybrid orbitals of $S$ and $O$
151. Which of the following pairs of ions have the same electronics configuration?
(d-and-f-block elements)
1) $\mathrm{Cu}^{2+}, \mathrm{Cr}^{2+}$
2) $\mathrm{Fe}^{3+}, \mathrm{Mn}^{2+}$
3) $\mathrm{CO}^{+3}, \mathrm{Ni}^{3+}$
4) $\mathrm{Sc}^{3+}, \mathrm{Cr}^{3+}$
152. Which of the following is not a neutral Ligand?
1) $\mathrm{H}_{2} \mathrm{O}$
2) $\mathrm{NH}_{3}$
3) ONO
4) CO

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153. Alkyl halides are immiscible in water though they are polar because
1)They react with water to give alcohols
2) They cannot form hydrogen bonds with water
3) C -X bond cannot be broken easily
4) They are stable compounds and are not reactive.
154. Picric acid is a yellow coloured compound. Its chemical name is
(Alcohols, Phenols and ethers)
1) $m$ - nitrobenzoic acid
2) 2, 4, 6 - trinitrophenol
3) 2, 4, 6 - tribromophenol
4) P - nitrophenol.
155. In the following sequence of reaction, the final product (z) is $\mathrm{CH} \equiv \mathrm{CH} \xrightarrow[\mathrm{H}_{2} \mathrm{SO}_{4}]{\mathrm{H}^{2+}} X \xrightarrow[\mathrm{H}_{2} \mathrm{O}]{\mathrm{CH}_{3} \mathrm{OX}} \mathrm{Y} \xrightarrow{[0]} \mathrm{Z}$
(Aldehydes, Ketones \& Carboxylic acids)
1) Ethanal
2) Propan - 2-ol
3) Propanone
4) propan-1-ol
156. The order of reactivity of $\mathrm{CH}_{3} \mathrm{CHO}, \mathrm{CH}_{3} \mathrm{COC}_{2} \mathrm{H}_{5}$ and $\mathrm{CH}_{3} \mathrm{COCH}_{3}$ is
(Aldehydes, Ketones \& Caboxylic acids)
1) $\mathrm{CH}_{3} \mathrm{CHO}>\mathrm{CH}_{3} \mathrm{COCH}_{3}>\mathrm{CH}_{3} \mathrm{COC}_{2} \mathrm{H}_{5}$
2) $\mathrm{C}_{2} \mathrm{H}_{5} \mathrm{COCH}_{3}>\mathrm{CH}_{3} \mathrm{COCH}_{3}>\mathrm{CH}_{3} \mathrm{CHO}$
3) $\mathrm{CH}_{3} \mathrm{COCH}_{3}>\mathrm{CH}_{3} \mathrm{CHO}>\mathrm{C}_{2} \mathrm{H}_{5} \mathrm{COCH}_{3}$
4) $\mathrm{CH}_{3} \mathrm{COCH}_{3}>\mathrm{C}_{2} \mathrm{H}_{5} \mathrm{COCH}_{3}>\mathrm{CH}_{3} \mathrm{CHO}$
157. Which of the following can exist as zwitter ion?
(Amines)
1) P-Aminoacetophenone
2) Sulphanilic acid
3) P-Nitroaminobenzene
4) P-Methoxyphenol
158. Vitamin $B_{2}$, a water soluble vitamin is also known as Ascorbic
1) Ascorbia acid
2) Riboflavin
3) Thiamine
159. Which of the following is a homopolymer?
1) Bakelite
2) Nylon 6,6
3) Neoprene
(Bio Molecules)
4) Pyridoxine
(Polymers)
5) Buna - S
(Chemistry in everyday life)
6) Chloramphenicol + glycerol
7) $2-3 \%$ solution of iodine in alcohol
8) $0.2 \%$ solution of phenol
9) Chloroxylenol and terpineol.

## MODEL PAPER - 6

## CHEMISTRY

121. An organic compound on analysis gave $\mathrm{C}=54.2 \%, \mathrm{H}=9.2 \%$ by mass, its empirical formula is
(Some Basic concept of chemistry)
1) $\mathrm{CHO}_{2}$
2) $\mathrm{CH}_{2} \mathrm{O}$
3) $\mathrm{C}_{2} \mathrm{H}_{8} \mathrm{O}$
4) $\mathrm{C}_{2} \mathrm{H}_{4} \mathrm{O}$
122. The radius of hydrogen atom in ground state is $0.53^{\circ} \mathrm{A}$. What will be the radius of $\mathrm{Li}^{2+}$ in the ground state ?
(Structure of Atom)
1) $1.06 \mathrm{~A}^{0}$
2) $0.265 \mathrm{~A}^{0}$
3) $0.17 \mathrm{~A}^{0}$
4) $0.53 \mathrm{~A}^{0}$
123. An electron in excited hydrogen atom falls from fifth energy level to second energy level. In which of the following regions, the spectrum line will be observed and is part of which series of the atomic spectrum?
(Structure of Atom)
1) Visible, Balmer
2) Ultraviolet, Lyman
3) Infrared, Paschen
4) Infrared, Brackett
124. Few general names are given along with their valence shell configurations. mark the incorrect name,
(Classification of elements)
1) $n s^{2} n p^{6}-$ Noble gases
2) $n s^{2} n p^{5}$ - Halogens
3) $\mathrm{ns}^{1}$ - Alkali metals
4) $n s^{2}-n p^{2}-$ Chalcogens
125. How many sigma and pi bonds are present in toluene? (Chemical Bonding \& Molecular structure)
1) $10 \sigma$ and $3 \pi$ bonds
2) $12 \sigma$ and $3 \pi$ bonds
3) $15 \sigma$ and $3 \pi$ bonds
4) $6 \sigma$ and $3 \pi$ bonds
126. Which of the following orbitals will not form sigma bond after overlapping ?
(Chemical Bonding \& Molecular structure)
1) $s$ - orbital and s - orbital
2) $s$ - orbital and $p_{z}$ - orbital
3) $p_{z}$ - orbital and $p_{z}$ - orbital
4) $p_{x}$ - orbital and $p_{x}$ - orbital
127. The correct value of the gas constant ' $R$ ' is close to
(States of Matter)
1) 0.082 litre - atmosphere $K$
2) 0.082 litre - atmosphere $\mathrm{K}^{-1} \mathrm{~mol}^{-1}$
3) 0.082 litre - atmosphere ${ }^{-1} \mathrm{~K} \mathrm{~mol}^{-1}$
4) 0.082 litre $^{-1}$ atmosphere ${ }^{-1} \mathrm{~K} \mathrm{~mol}$.
128. Value of gas constant $R$ in the ideal gas equation $P V=n R T$ depends upon
(States of Matter)
1) Temperature of the gas
2) Pressure of the gas
3) Units in which $P, V$ and $T$ are measured
4) nature of the gas
129. What will be $\Delta \mathrm{H}$ for the reaction, $\mathrm{CH}_{2} \mathrm{Cl}_{2} \rightarrow \mathrm{C}+2 \mathrm{H}+2 \mathrm{Cl}\left(\mathrm{B} . \mathrm{E}\right.$ of $\mathrm{C}-\mathrm{H}$ and $\mathrm{C}-\mathrm{Cl}$ bonds are $416 \mathrm{KJ} \mathrm{mol}^{-1}$ and $325 \mathrm{KJ} \mathrm{mol}^{-1}$ respectively
(Thermodynamics)
1) 832 KJ
2) 1482 KJ
3) 650 KJ
4) 1855 KJ
130. Which of the following species can act both as an acid as well as a base ?
(Equilibrium)
1) $\mathrm{SO}_{4}^{2-}$
2) $\mathrm{HSO}_{4}^{-}$
3) $\mathrm{PO}_{4}^{3-}$
4) $\mathrm{OH}^{-}$
131. The oxidation state of Fe in $\mathrm{K}_{4}\left[\mathrm{Fe}(\mathrm{CN})_{6}\right]$ is
(Redox Reactions)
1) +2
2) +3
3) +4
4) +6
132. The stoichiometric constants for the reaction $\mathrm{pCu}+\mathrm{qHNO}_{3} \rightarrow \mathrm{rCu}\left(\mathrm{NO}_{3}\right)_{2}+\mathrm{sNO}+\mathrm{tH}_{2} \mathrm{O}$
1) $3,3,3,2,3$
2) $3,2,3,2,4$
3) $3,8,3,2,4$
4) $2,3,3,3,2$
133. The temporary hardness of water due to calcium bicarbonate can be removed by adding
(Redox Reactions)
1) $\mathrm{CaCO}_{3}$
2) $\mathrm{CaCl}_{2}$
3) HCl
4) $\mathrm{Ca}(\mathrm{OH})_{2}$
134. Which of the following is arranged according to increasing basic strength ?
(S-Block elements)
1) $\mathrm{CaO}<\mathrm{MgO}<\mathrm{SrO}<\mathrm{BaO}<\mathrm{BeO}$
2) $\mathrm{BaO}<\mathrm{SrO}<\mathrm{CaO}<\mathrm{MgO}<\mathrm{BeO}$
3) $\mathrm{BeO}<\mathrm{MgO}<\mathrm{CaO}<\mathrm{BaO}<\mathrm{SrO}$
4) $\mathrm{BeO}<\mathrm{MgO}<\mathrm{CaO}<\mathrm{SrO}<\mathrm{BaO}$
(P-Block elements)
135. Chemically borax is
2) Sodium orthoborate
3) Sodium metaborate
4) Sodium hexaborate
5) Sodium tetraborate decahydrate
) In making enamel and (P-Block elements)
6) As a styptic to stop bleeding 2) In making enamel and pottery glazes
7) As a flux in soldering
8) In making optical glasses.
137. Which of the following is an electrophilic reagent?
(Organic chemistry-some Basic Principle)
1) $\mathrm{H}_{2} \mathrm{O}$
2) $\mathrm{NH}_{3}$
3) $\mathrm{OH}^{-}$
4) $\mathrm{NO}_{2}^{+}$
138. $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{OH} \xrightarrow[170^{\circ} \mathrm{C}]{\text { conc. } \mathrm{H}_{4} \mathrm{SO}_{4}} \mathrm{~A} \xrightarrow[500^{\circ} \mathrm{C}]{\mathrm{Cl}_{2}} \mathrm{~B} A$ and $B$ are
(Hydro Carbons)
1) $\mathrm{A}=\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{3}, \mathrm{~B}=\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{Cl}$
2) $\mathrm{A}=\mathrm{CH}_{3} \mathrm{CH}=\mathrm{CH}_{2}, \mathrm{~B}=\mathrm{CH}_{2} \mathrm{CICH}=\mathrm{CH}_{2}$
3) $\mathrm{A}=\mathrm{CH}_{2}=\mathrm{CH}_{2}, \mathrm{~B}=\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{Cl}$
4) $\mathrm{A}=\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{3}, \mathrm{~B}=\mathrm{CH}_{3} \mathrm{CH}=\mathrm{CH}_{2}$
139. The most acidic hydrogen atoms are present in
(Hydro Carbons)
3) ethyne
4) ethane
5) ethene
6) benzene,
140. Mark the example which is not correctly matched?
(Environmental Chemistry)
1) Air pollutants - Oxides of sulphur, nitrogen and carbon
2) Particulate pollutants - Dust, mist, fumes
3) Global warming - methane, Ozone, CFC's
4) Water soluble chemical pollutants - Oxides of nitrogen, carbon and sodium

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141. A solid $A B$ has a rock salt structure. If radius of cation $A^{+}$is 120 pm , what is the minimum value of radius of $B$ anion?
(Solid State)
1) 120 pm
2) 240 pm
3) 290 pm
4) 360 pm
142. $10 \%$ solution of urea is isotonic with $6 \%$ solution of a non - volatile solute X , what is the molecular massof solute $X$ ?
(Solutions)
1) $6 \mathrm{~g} \mathrm{~mol}^{-1}$
2) $60 \mathrm{~g} \mathrm{~mol}^{-1}$
3) $36 \mathrm{~g} \mathrm{~mol}^{-1}$
4) $32 \mathrm{~g} \mathrm{~mol}^{-1}$
143. Specific conductance of 0.1 M NaCl solution is $1.01 \times 10^{-2} \mathrm{ohm}^{-1} \mathrm{~cm}^{-1}$. Its molar conductance in ohm ${ }^{-1} \mathrm{~cm}^{2} \mathrm{~mol}^{-}$ ${ }^{1}$ is
(Electro Chemistry)
1) $1.01 \times 10^{2}$
2) $1.01 \times 10^{3}$
3) $1.01 \times 10^{4}$
4) 1.01
144. How much electricity in terms of faraday is required to produce 100 g of Ca from molten $\mathrm{CaCl}_{2}$ ?
1) 1 F
2) 2 F
3) 3 F
4) 5 F
145. A first order reaction is $20 \%$ complete in 10 minutes. what is the specific rate constant for the reaction
(Chemical Kinetics)
1) $0.0970 \mathrm{~min}^{-1}$
2) $0.009 \mathrm{~min}^{-1}$
3) $0.0223 \mathrm{~min}^{-1}$
4) $2.223 \mathrm{~min}^{-1}$
146. In a first order reaction, the concentration of reactant is reduced to $1 / 8$ of the initial concentration in 75 minutes at 298 K . what is the half - life period of the reaction in minutes? (Chemical Kinetics)
1) 50 min
2) 15 min
3) 30 min
4) 25 min
147. Which of the following gases present in a polluted area will be adsorbed most easily on the charcoal gas mask?
1) $\mathrm{H}_{2}$
2) $\mathrm{O}_{3}$
3) $\mathrm{N}_{2}$
4) $\mathrm{SO}_{2}$
(Surface Chemistry)
148. Which of the following metals cannot be obtained by reduction of its metal oxide by aluminium ?

## (Genral Principles and Process of Isolation of elements)

1) Cr
2) Mn
3) Fe
4) Mg
149. Dry $\mathrm{SO}_{2}$ does not bleach dry flowers because
(P-Block Elements)
1) nascent hydrogen responsible for bleaching is produced only in presence of moisture
2) Water is the actual reducing agent responsible for bleaching
3) Water is stronger acid than $\mathrm{SO}_{2}$
4) The $\mathrm{OH}^{-}$ions produced by water cause bleaching
150. Match the column I with column II and mark the appropriate choice.

Column - I
Column - II
A. Thiosulphuric acid
(i) $\mathrm{H}_{2} \mathrm{SO}_{5}$
B. Caro's acid
(ii) $\mathrm{H}_{2} \mathrm{~S}_{2} \mathrm{O}_{6}$
C. Marshall's acid
(iii) $\mathrm{H}_{2} \mathrm{~S}_{2} \mathrm{O}_{3}$
(iv) $\mathrm{H}_{2} \mathrm{~S}_{2} \mathrm{O}_{8}$
2) $A \rightarrow$ (iv); $B \rightarrow$ (iii); $C \rightarrow$ (ii) $D \rightarrow$ (i)
4) $\mathrm{A} \rightarrow$ (ii); $\mathrm{B} \rightarrow$ (iii); $\mathrm{C} \rightarrow$ (i) $\mathrm{D} \rightarrow$ (iv)

1) $A \rightarrow$ (i); $B \rightarrow$ (ii); $C \rightarrow$
(iii) $\mathrm{D} \rightarrow$ (iv)
(P-Block Elements)
1. The equation $3 \mathrm{MnO}_{4}^{2+}+4 \mathrm{H}^{+} \rightarrow 2 \mathrm{MnO}_{4}^{-}+2 \mathrm{H}_{2} \mathrm{O}$ respresents $2 \mathrm{MnO}_{4}^{-}+\mathrm{MnO}_{2}+2 \mathrm{H}_{2} \mathrm{O}$ (d-and-f-block
$\begin{array}{lll}\text { 1) reduction } & \text { 2) disproportionation } & \text { 3) Oxidation in acidic medium 4) Reduction in acidic medium }\end{array}$
(d-and-f-block elements)
2. The correct IUPAC name of the coordinattion compound $\mathrm{K}_{3}\left[\mathrm{Fe}(\mathrm{CN})_{5} \mathrm{NO}\right]$ is (Co-ordination Compounds)
1) Potassium pentacyanonitrosylferrate (II)
2) Potassium pentacyanonitroferrate (III)
3) Potassium nitritopentacyanoferrate (IV)
4) Potassium nitritepentacyanoiron (II)
153. $\mathrm{CH}_{3} \mathrm{OH} \xrightarrow{\mathrm{Pl}_{3}} \mathrm{X} \xrightarrow{\mathrm{KCN}} \mathrm{Y} \xrightarrow{\text { Hydrolysis }} \mathrm{Z}$. The final product in the reaction is (HaloAlkanes \& Halo Arenes)
1) $\mathrm{CH}_{3} \mathrm{OH}$
2) HCOOH
3) $\mathrm{CH}_{3} \mathrm{CHO}$
4) $\mathrm{CH}_{3} \mathrm{COOH}$
54. The most suitable reagent for the conversion of $\mathrm{RCH}_{2} \mathrm{OH} \rightarrow \mathrm{RCHO}$
(Alcohols, Phenols and ethers)
1) $\mathrm{K}_{2} \mathrm{Cr}_{2} \mathrm{O}_{7}$
2) $\mathrm{CrO}_{3}$
3) $\mathrm{KMnO}_{4}$
4) PCC
155. Identify $(\mathrm{X}),(\mathrm{Y})$ and $(\mathrm{Z})$ reagents in the given sequence of reaction.
$\mathrm{CH} \equiv \mathrm{CH} \xrightarrow{x} \mathrm{CH}_{3} \mathrm{CHO} \xrightarrow{r} \mathrm{CH}_{3} \mathrm{CH}(\mathrm{OH}) \mathrm{CH}_{3} \xrightarrow{z} \mathrm{CH}_{3} \mathrm{COCH}_{3}$
(Aldehydes, Ketones \& Carboxylic acids)
1) $\mathrm{X}=\mathrm{H}_{2} \mathrm{SO}_{4} \quad \mathrm{Y}=\mathrm{H}_{2} \mathrm{O} / \mathrm{OH}^{-} \quad \mathrm{Z}=\mathrm{PCl}_{5}$, heat
2) $X=\mathrm{HNO}_{3}, Y=\mathrm{Na}_{2} \mathrm{CO}_{3}, \mathrm{Z}=\mathrm{H}_{2} \mathrm{SO}_{4}$, heat
3) $\mathrm{X}=\mathrm{H}_{2} \mathrm{SO}_{4} / \mathrm{Hg}^{2+}, \mathrm{Y}=\mathrm{PCl}_{5} / \mathrm{H}_{2} \mathrm{O}, \mathrm{Z}=\mathrm{K}_{2} \mathrm{Cr}_{2} \mathrm{O}_{7} / \mathrm{OH}^{-}$
4) $\mathrm{X}=\mathrm{H}_{2} \mathrm{SO}_{4} / \mathrm{Hg}^{2+}, \mathrm{Y}=\mathrm{CH}_{3} \mathrm{MgBr} / \mathrm{H}_{2} \mathrm{O}, \mathrm{Z}=\mathrm{K}_{2}^{2} \mathrm{Cr}_{2} \mathrm{O}_{7} / \mathrm{H}^{+}$
156. Which of the following does not answer iodoform test?
1) $n$ - Butyl alcohol
2) sec-Butyl alcohol
3) Acetophenone
157. Which of the follwoing has highest $\mathrm{pK}_{\mathrm{b}}$ value
3) $\left(\mathrm{CH}_{3}\right)_{2} \mathrm{NH}$
4) $\left(\mathrm{CH}_{3}\right)_{3} \mathrm{CNH}_{2}$
5) $\mathrm{NH}_{3}$
6) $\mathrm{CH}_{3} \mathrm{NH}_{2}$
(Bio Molecules)
158. Deficiency of vitamin E causes
1) rickets
2) scurvy
3) muscular weakness
(Aldehydes, Ketones \& Carboxylic acids)
4) Acetaldehyde
5) beri beri.
(Polymers)
6) neoprene
7) Terylene
8) teflon
9) nylon 6
160. An ester which is effective in curing malaria is
1) ethyl acetate
2) methyl acetate
3) methyl salicylate

## (Chemistry in everyday life)

4) ethyl benzoate

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## MODEL PAPER - 7

## CHEMISTRY

121. How much copper is present in 50 gr of $\mathrm{CuSO}_{4}$ ?
1) 19.90 g
2) 39.81 g
3) 63.5 g
(Some Basic concept of chemistry)
122. The de Broglie wavelength associated with a ball of mass 200 g and moving at aspeed of 5 meters / hour, is of the order of $\left(\mathrm{h}=6.625 \times 10^{-34} \mathrm{~J} \mathrm{~s}\right)$ is (Structure of Atom)
1) $10^{-15} \mathrm{~m}$
2) $10^{-20} \mathrm{~m}$
3) $10^{-25} \mathrm{~m}$
4) $10^{-30} \mathrm{~m}$
123. If uncertainty priciple is applied to an object of mass 1 milligram, the uncertainty value of velocity and position will be
(Structure of Atom)
1) $10^{-4} \mathrm{~m}^{2} \mathrm{~s}^{-1}$
2) $10^{6} \mathrm{~m}^{2} \mathrm{~s}^{-1}$
3) $10^{-28} \mathrm{~m}^{2} \mathrm{~s}^{-1}$
4) $10^{-34} \mathrm{~m}^{2} \mathrm{~s}^{-1}$
124. In the long form of periodic table, the non - metals are placed in
1) s-block
2) p-block
3) d-block
(Classification of elements)
125. Which of the following pairs are isostructural ?
4) f-block
(Chemical Bonding \& Molecular
structure)
5) $\mathrm{SO}^{2+}$ and $\mathrm{BF}_{4}^{-}$
6) $\mathrm{NH}_{3}$ and $\mathrm{NH}_{4}^{+}$
7) $\mathrm{CO}_{3}^{2-}$ and $\mathrm{CO}_{2}$
8) $\mathrm{CH}_{4}$ and $\mathrm{BF}_{3}$
126. Which type of hybridisation is shown by carbon atom from left to right in the given compound;

$$
\mathrm{CH}_{2}=\mathrm{CH}-\mathrm{C} \equiv \mathrm{~N} ?
$$

(Chemical Bonding \& Molecular

## structure)

1) $s p^{2}, s p^{2}, s p$
2) $s p^{2}, s p, s p$
3) $\mathrm{sp}, \mathrm{sp}^{2}, \mathrm{sp}^{3}$
4) $s p^{3}, s p^{2}, s p$
127. For an ideal gas, number of moles per litre in terms of its pressure, temperature and gas constant is
(States of Matter)
1) $P T / R$
2) $P / R T$
3) $P R T$
4) $R T / P$
128. If the ratio of masses of $\mathrm{SO}_{3}$ and $\mathrm{O}_{2}$ gases confined in a vessel is $1: 1$ then the ratio of their partial pressures would be
2) $2: 5$
3) $2: 1$
4) $1: 2$
129. Formation of ammonia is shown by the reaction, $\mathrm{N}_{2(\mathrm{~g})}+3 \mathrm{H}_{2(\mathrm{~g})} \rightarrow 2 \mathrm{NH}_{3(\mathrm{~g})}, \Delta_{\mathrm{r}} \mathrm{H}^{0}=-91.8 \mathrm{~kJ} \mathrm{~mol}^{-1}$ what will be the enthalpy of reaction for decompostiton of $\mathrm{NH}_{3}$ according to the reaction? $2 \mathrm{NH}_{3(\mathrm{~g})} \rightarrow \mathrm{N}_{2(\mathrm{~g})}+3 \mathrm{H}_{2(\mathrm{~g})} \Delta{ }_{\mathrm{r}} \mathrm{H}^{0}=$ ?
(Thermodynamics)
1) $-91.8 \mathrm{~kJ} \mathrm{~mol}^{-1}$
2) $+91.8 \mathrm{~kJ} \mathrm{~mol}^{-1}$
3) $-45.9 \mathrm{~kJ} \mathrm{~mol}^{-1}$
4) $+45.9 \mathrm{~kJ} \mathrm{~mol}^{-1}$
130. 0.05 mole of NaOH is added to 5 litres of water. What will be the pH of the solution?
(Equilibrium)
1) 12
2) 7
3) 2
4) 10
131. When KMnO 4 is reduced with oxalic acid in acidic solution, the oxidation number of Mn changes from
(Redox Reactions)
1) +2 to +7
2) +4 to +7
3) +7 to +2
4) +6 to +2
132. In which of the following compounds carbon is in highest oxidation state?
(Redox Reactions)
1) $\mathrm{CH}_{3} \mathrm{Cl}$
2) $\mathrm{CCl}_{3}$
3) $\mathrm{CHCl}_{3}$
4) $\mathrm{CH}_{2} \mathrm{Cl}_{2}$
133. In a permutit, the calcium and magnesium ions of hard water are exchanged by
(Hydrogen)
1) $\mathrm{CO}^{2-}{ }_{3}$ and $\mathrm{HCO}_{3}^{-}$ions of premitit
2) $\mathrm{Na}^{+}$ions of permutit
3) $\mathrm{Al}^{3+}$ ions of permutit
4) $\mathrm{Si}^{4+}$ ions of permutit
134. The pair of amphoteric oxides is
(S-Block elements)
1) $\mathrm{BeO}, \mathrm{ZnO}$
2) $\mathrm{Al}_{2} \mathrm{O}_{3}, \mathrm{Li}_{2} \mathrm{O}$
3) $\mathrm{BeO}, \mathrm{BO}_{3}$
4) $\mathrm{BeO}, \mathrm{MgO}$
135. In which of the following the inert pair effect is most prominent?
1) C
2) Ge
3) Si
136. Buckminsterfullerene is
1) Graphite
2) diamond
3) $\mathrm{C}-60$
4) Pb
(P-Block elements)
. The increasing order of stability of the following radicals is
(P-Block elements)
5) quartz
(Organic chemistry-some Basic Principle)
6) $\left(\mathrm{CH}_{3}\right)_{2}{ }_{\mathrm{C}}^{\mathrm{C}} \mathrm{H}<\left(\mathrm{CH}_{3}\right)_{3} \stackrel{0}{\mathrm{C}}<\left(\mathrm{C}_{6} \mathrm{H}_{5}\right)_{2}{ }_{\mathrm{C}}^{\mathrm{C}} \mathrm{H}<\left(\mathrm{C}_{6} \mathrm{H}_{5}\right)_{3} \stackrel{0}{\mathrm{C}}$
7) $\left(\mathrm{C}_{6} \mathrm{H}_{5}\right)_{3} \stackrel{0}{\mathrm{C}}<\left(\mathrm{C}_{6} \mathrm{H}_{5}\right)_{2} \stackrel{0}{\mathrm{C}} \mathrm{H}<\left(\mathrm{CH}_{3}\right)_{3}{ }_{\mathrm{C}}^{\mathrm{C}}<\left(\mathrm{CH}_{3}\right)_{2}{ }_{\mathrm{C}}^{\mathrm{C}} \mathrm{H}$
8) $\left(\mathrm{C}_{6} \mathrm{H}_{5}\right)_{2}{ }_{\mathrm{C}}^{\mathrm{C}} \mathrm{H},\left(\mathrm{C}_{6} \mathrm{H}_{5}\right)_{3} \stackrel{0}{\mathrm{C}}<\left(\mathrm{CH}_{3}\right)_{3} \stackrel{0}{\mathrm{C}}<\left(\mathrm{CH}_{3}\right)_{2}{ }_{\mathrm{C}} \mathrm{O} \mathrm{H}$
9) $\left(\mathrm{CH}_{3}\right)_{2}{ }_{\mathrm{C}}^{0} \mathrm{H}<\left(\mathrm{CH}_{3}\right)_{3} \stackrel{0}{\mathrm{C}}<\left(\mathrm{C}_{6} \mathrm{H}_{5}\right)_{3} \stackrel{0}{\mathrm{C}}<\left(\mathrm{C}_{6} \mathrm{H}_{5}\right)_{2}{ }^{0} \mathrm{H}$
138. The ozonolysis products (s) of the following reaction is (are)

$$
\mathrm{CH}_{3} \mathrm{CH}_{2}-\mathrm{C} \equiv \mathrm{CH} \xrightarrow\left[\left(\text { (i) } \mathrm{H}_{2} \mathrm{O}\right]{(\mathrm{O}} \mathrm{P}\right. \text { Product(s) }
$$

(Hydro Carbons)

1) $\mathrm{CH}_{3} \mathrm{COCH}_{3}$
2) $\mathrm{CH}_{3} \mathrm{COCH}_{3}+\mathrm{HCHO}$
3) $\left.\mathrm{CH}_{3} \mathrm{COOH}+\mathrm{HCOOH} 4\right) \mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{COOH}+\mathrm{HCOOH}$
139. When 1-butyne undergoes oxymercuration with the help of $\mathrm{HgSO}_{4}+\mathrm{H}_{2} \mathrm{SO}_{4}$, the product (s) formed is /are
(Hydro Carbons)
1) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{COOH}+\mathrm{HCOOH}$
2) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{COCH}_{3}$
3) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{COOH}$
4) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{CHO}$
140. Biological Oxygen demand (BOD) can be defined as,
(Environmental Chemistry)
1) The amount of oxygen required by bacteria to break down the organic matter of a sample of water
2) The amount of chemicals required to break down the organic matter of a sample of water
3) The amount of phosphate required to oxidise the organic matter of a sample of water
4) The amount of organic matter present in the given sample of water.
141. The edge length of sodium chloride unit cell is 564 pm . If the size of $\mathrm{Cl}^{-}$ion is 181 pm . The size of $\mathrm{Na}^{+}$ion will
be
(Solid State)
1) 101 pm
2) 181 pm
3) 410 pm
4) 202 pm
142. A solution containing 12.5 g of non-electrolyte substance in 185 g of water shows boiling point elevation of 0.80 K calculate the molar mass of the substances. ( $\mathrm{Kb}=0.52 \mathrm{~K} \mathrm{~kg} \mathrm{~mol}-1$ )
(Solutions)
1) $53.06 \mathrm{~g} \mathrm{~mol}^{-1}$
2) $25.3 \mathrm{~g} \mathrm{~mol}^{-1}$
3) $16.08 \mathrm{~g} \mathrm{~mol}^{-1}$
4) $43.92 \mathrm{~g} \mathrm{~mol}^{-1}$
143. If a current of 1.5 ampere flows through a metallic wire for 3 hours, then how many electrons would flow through the wire?
(Electro Chemistry)
1) $2.25 \times 10^{22}$ electrons $\quad$ 2) $1.13 \times 10^{23}$ electrons 3 3) $1.01 \times 10^{23}$ electrons 4) $4.5 \times 10^{23}$ electrons
144. An electric charge of 5 Faradays is passed through three electrolytes $\mathrm{AgNO}_{3}, \mathrm{CuSO}_{4}$ and $\mathrm{FeCl}_{2}$ solution. The grams of each metal liberated at cathode will be (Electro Chemistry)
1) $\mathrm{Ag}=10.8 \mathrm{~g}, \mathrm{Cu}=12.7 \mathrm{~g}, \mathrm{Fe}=1.11 \mathrm{~g}$
2) $\mathrm{Ag}=540 \mathrm{~g}, \mathrm{Cu}=367.5 \mathrm{~g}, \mathrm{Fe}=325 \mathrm{~g}$
3) $\mathrm{Ag}=108 \mathrm{~g}, \mathrm{Cu}=63.5 \mathrm{~g}, \mathrm{Fe}=56 \mathrm{~g}$
4) $\mathrm{Ag}=540 \mathrm{~g}, \mathrm{Cu}=158.8 \mathrm{Fe}=93.3 \mathrm{~g}$
145. A first order reaction takes 40 min for $30 \%$ decomposition. What will be $t_{1 / 2}$ ?
(Chemical Kinetics)
1) 77.7 min
2) 52.5 min
3) 46.2 min
4) 22.7 min
146. The expression to calculate time required for completion of zero order reaction is
(Chemical Kinetics)
1) $t=\frac{\left[R_{0}\right]}{k}$
2) $t=[R]-\left[R_{0}\right]$
3) $t=\frac{k}{\left[R_{0}\right]}$
4) $\mathrm{t}=\frac{\left[\mathrm{R}_{0}\right]-[\mathrm{R}]}{\left[\mathrm{R}_{0}\right]}$
147. Movement of dispersion medium under the influence of electric field is known as
(Surface Chemistry)
1) electrodialysis
2) electrophoresis
3) electroosmosis
4) cataphoresis.
148. In blast furnace iron oxide is reduced by
(Genral Principles and Process of Isolation of elements)
1) Silica
2) Carbon monoxide
3) Carbon
4) lime stone.
149. Sulphur trioxide is not directly dissolve in water to form sulphuric acid because
(P-Block Elements)
1) $\mathrm{SO}_{3}$ does not react with water to form acid
2) $\mathrm{SO}_{3}$ gets oxidised to $\mathrm{H}_{2} \mathrm{SO}_{3}$ when dissolve in water
3) It results in the formation of dense fog of sulphuric acid which is difficult to condense
4) Sulphur trioxide is insoluble in water due to its covalent nature.
150. The correct order of increasing electron affinity of halogens is
(P-Block Elements)
1) l $<\mathrm{Br}<\mathrm{Cl}$
2) $\mathrm{Br}<\mathrm{I}<\mathrm{Cl}$
3) $\mathrm{Cl}<\mathrm{Br}<1$
4) l $<\mathrm{Cl}<\mathrm{Br}$
151. The common oxidation state shown by lanthanides, in their compounds is
(d- and -f-block elements)
1) +1
2) +3
3) +5
4) +6
(Co-ordination Compounds)
152. The hybridisation involved in $\left[\mathrm{Co}\left(\mathrm{C}_{2} \mathrm{O}_{4}\right)_{3}\right]^{3-}$ is
1) $s p^{3} d^{2}$
2) $s p^{3} d^{3}$
3) $\mathrm{dsp}^{3}$
4) $d^{2} s p^{3}$
153. A mixture of 1 - chloropropane and 2 - choloropropane when treated with alcoholic KOH gives
(HaloAlkanes \& Halo Arenes)
1) Prop - 1 -ene
2) Prop - 2 - ene
3) a mixture of prop - 1 - ene and prop -2- ene
4) Propanol.
154. Which of the following is phenol?
1) Cresol
2) Catechol
3) Benzenol
(Alcohols, Phenols and ethers)
155. To differentiate between pentan-2-one and pentan-3-one a test is carried out. Which of the following is the correct answer ?
(Aldehydes, Ketones \& Carboxylic acids)
1) Pentan - 2 - one will give silver mirro test
2) Pentan - 2 - one will give iodoform test.
3) pentan- 3 -one will give iodoform test
4) None of these.
156. Which of the following compound will undergo self aldol condensation in the presence of cold dilute alkali?
(Aldehydes, Ketones \& Carboxylic acids)
1) $\mathrm{CH} \equiv \mathrm{C}-\mathrm{CHO}$
2) $\mathrm{CH}_{2}=\mathrm{CHCHO}$
3) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{CHO}$
4) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CHO}$
157. Which of the following is amphoteric in nature ?
1) $\mathrm{CH}_{3} \mathrm{NH}_{2}$
2) $\mathrm{CH}_{3} \mathrm{NHCH}_{3}$
3) $\mathrm{CH}_{3} \mathrm{CONH}_{2}$
(Amines)
4) $\mathrm{CH}_{3}-\mathrm{N}-\mathrm{CH}_{3}$
$\mathrm{CH}_{3}$
(Bio Molecules)
158. Bases common to RNA and DNA are
2) adenine , Uracil, cytosine
3) adenine, guanine, cytosine
4) guanine, uracil, thymine
159. Polymer which has amide linkage is
1) nylon - 6,6
2) terylene
3) teflon
160. Which of the following antibiotics is bactericidal?
1) Erythromycin
2) Tetracycline
3) Pencillin
4) bakelite.
(Chemistry in everyday life)
5) Chloramphenicol

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## MODEL PAPER - 8

## CHEMISTRY

121. How much oxygen is required for complete combustion of 560 g of ethene (Some Basic concept of chemistry)
1) 6.4 kg
2) 1.92 kg
3) 2.8 kg
4) 9.6 kg
122. What will be the wavelength of an electron moving with $\frac{1}{10}$ th of velocity of light? $\quad$ (Structure of Atom)
1) $2.43 \times 10^{-11} \mathrm{~m}$
2) $243 \times 10^{-11} \mathrm{~m}$
3) 0.243 m
4) $2.43 \times 10^{-4} \mathrm{~m}$
123. What will be the mass of a particle if uncertainty in its position is $10^{-8} \mathrm{~m}$ and velocity is $5.26 \times 10^{-25} \mathrm{~m} \mathrm{~s}^{-1}$ ?
1) 0.01 kg
2) 0.1 kg
3) 1 kg
4) 10 kg
124. The first ionisation enthalpy of the elements are in the order of
(Structure of Atom)
1) $\mathrm{C}<\mathrm{N}<\mathrm{Si}<\mathrm{P}$
2) $N<$ Si $<C<P$
3) $\mathrm{Si}<$ P $<$ C $<N$
4) P $<$ Si $<$ N $<$ C
125. Order of size of $\mathrm{sp}, \mathrm{sp}^{2}$ and $\mathrm{sp}^{3}$ orbitals is
(Chemical Bonding \& Molecular structure)
1) $\mathrm{sp}^{3}<\mathrm{sp}^{2}<\mathrm{sp}$
2) $s p<\mathrm{sp}^{2}<\mathrm{sp}^{3}$
3) $\mathrm{sp}^{2}<\mathrm{sp}<\mathrm{sp}^{3}$
4) $\mathrm{sp}^{2}<\mathrm{sp}^{3}<\mathrm{sp}$
126. Hybridisation state of Xe in $\mathrm{XeF}_{2}, \mathrm{XeF}_{4}$ and $\mathrm{XeF}_{6}$ respectively are
1) $s p^{2}, s p^{3} d, s p^{3} d^{2}$
2) $s p^{3} d, s p^{3} d^{2}, s p^{3} d^{3}$
3) $s p^{3} d^{2}, s p^{3} d, s p^{3} d^{3}$
(Chemical Bonding \& Molecular structure)
127. Equal masses of helium and oxygen are mixed in a container at $25^{\circ} \mathrm{C}$. The fraction of the total pressure exerted by oxygen in the mixture of gases is
(States of Matter)
1) $1 / 3$
2) $2 / 3$
3) $1 / 9$
4) $4 / 9$
128. Taking into account the pressure and volume corrections, the gas equation can be written as
(States of Matter)
1) $\left(p+\frac{a^{2}}{v^{2}}\right)(V-b)=n R T$
2) $\left(p+\frac{a^{2}}{V^{2}}\right)(V-n b)=n R T$
3) $\left(p+\frac{a V}{n R T}\right)\left(\frac{V-b}{n R T}\right)=R T$
4) $\left(p+\frac{Z}{V^{2}}\right)(V-Z b)=n R T$
129. The enthalpy of formaion of ammonia when calculated from the following bond energy data is (B.E of $\mathrm{N}-\mathrm{H}, \mathrm{H}$ $-\mathrm{H}, \mathrm{N} \equiv \mathrm{N}$ is $389 \mathrm{~kJ} \mathrm{~mol}^{-1},, 435 \mathrm{~kJ} \mathrm{~mol}^{-1}, 945.36 \mathrm{~kJ} \mathrm{~mol}^{-1}$ respectively)
(Thermodynamics)
1) $-41.82 \mathrm{~kJ} \mathrm{~mol}^{-1}$
2) $+83.64 \mathrm{k} \mathrm{mol}^{-1}$
3) $-945.36 \mathrm{~kJ} \mathrm{~mol}^{-1}$
4) $-833 \mathrm{~kJ} \mathrm{~mol}^{-1}$
130. The pH of $0.001 \mathrm{M} \mathrm{Ba}(\mathrm{OH})_{2}$ solution will be
1) 2
2) 8.4
3) 11.3
(Equilibrium)
131. The number of moles of $\mathrm{K}_{2} \mathrm{Cr}_{2} \mathrm{O}_{7}$ reduced by one mole of $\mathrm{Sn}^{2+}$ ions is
1) $1 / 3$
2) $1 / 6$
3) $2 / 3$
4) $3 / 4$
5) 2.7
132. Which of the following is the strongest oxidizing agent?
1) $F_{2}$
2) $\mathrm{Cl}_{2}$
3) $\mathrm{Br}_{2}$
4) $I_{2}$
133. Which of the following represents calgon?

Br

1) $\mathrm{Na}_{2} \mathrm{Al}_{2} \mathrm{Si}_{2} \mathrm{O}_{8}$
2) $\mathrm{Mg}_{3}\left(\mathrm{PO}_{4}\right)_{2}$
3) $\mathrm{Na}_{2}\left[\mathrm{Na}_{4}\left(\mathrm{PO}_{3}\right)_{6}\right]$
4) $\mathrm{Na}_{2}\left[\mathrm{Mg}_{2}\left(\mathrm{PO}_{3}\right)_{6}\right]$
134. Which of the following is not present in portland cement?
1) $\mathrm{Ca}_{3} \mathrm{Al}_{2} \mathrm{O}_{6}$
2) $\mathrm{Ca}_{3} \mathrm{SiO}_{5}$
3) $\mathrm{Ca}_{2} \mathrm{SiO}_{4}$
4) $\mathrm{Ca}_{3}\left(\mathrm{PO}_{4}\right)_{2}$
135. Which of the follwoing is not a use of graphite?
1) For electrodes in batteries
2) Crucibles made from graphite are used for its inertness to dilute acids and alkalies
3) For adsorbing poisonous gases.
4) Lubricant at high temperature.
136. In $\mathrm{SiO}_{4}^{4}$, the tetrahedral molecule, two oxygen atoms are shared in
(P-Block elements)
1) Sheet silicates
2) double - chain silicates
3) chain silicates
4) three-dimentional silicates
137. Which of the following is the correct order of acidity of carboxylic acids?(Organic chemistry-some Basic Principle)
i) $\mathrm{Cl}_{3} \mathrm{CCOOH}>\mathrm{Cl}_{2} \mathrm{CHCOOH}>\mathrm{ClCH}_{2} \mathrm{COOH}$
ii) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{COOH}>\left(\mathrm{CH}_{3}\right)_{2} \mathrm{CHCOOH}>\left(\mathrm{CH}_{3}\right)_{2} \mathrm{CCOOH}$
ii) $\mathrm{F}_{2} \mathrm{CHCOOH}>\mathrm{FCH}_{2} \mathrm{COOH}>\mathrm{CICH}_{2} \mathrm{COOH}$
1) (i) and (ii)
2) (ii) and (iii)
3) (i) and (iii)
4) (i), (ii) and (iii)
138. Identify $X$ and $Y$ in the following reaction. $\underset{\substack{\text { Br } \\ \text { Br }}}{\mathrm{H}_{2} \mathrm{C}-\underset{\mathrm{Br}}{\mathrm{C}}} \underset{2}{\mathrm{CH}_{2}}+\mathrm{KOH} \xrightarrow{\text { alconol }} X \xrightarrow{\mathrm{NaNH}_{2}} Y$
(Hydro Carbons)
1) $\mathrm{X}=\mathrm{CH}_{3} \mathrm{CHBr}, \mathrm{Y}=\mathrm{CH}_{2}=\mathrm{CH}_{2}$
2) $\mathrm{X}=\mathrm{CH}_{2} \mathrm{OH}-\mathrm{CH}_{2} \mathrm{OH}, \mathrm{Y}=\mathrm{CH}_{2}=\mathrm{CH}_{2}$
3) $\mathrm{X}=\mathrm{CH}_{2}=\mathrm{CHBr}, \mathrm{Y}=\mathrm{CH} \equiv \mathrm{CH}$
4) $\mathrm{X}=\mathrm{CH} \equiv \mathrm{CBr}, \mathrm{Y}=\mathrm{CH} \equiv \mathrm{CH}$
139. Identify the reagent from the following list which can easily distinguish between 1 - butyne and 2 - butyne
(Hydro Carbons)
1) Bromine water
2) Baeyer's reagent
3) Dilute $\mathrm{H}_{2} \mathrm{SO}_{4}+\mathrm{HgSO}_{4}$
4) Ammonical $\mathrm{Cu}_{2} \mathrm{Cl}_{2}$
140. Mark the incorrect choice of ill effects caused by the pollutant.
(Environmental Chemistry)
1) Lead - Kidney, Liver, Reproductive system
2) Fluoride - Bones and teeth
3) Nitrate - Blue baby's syndrome
4) Sulphur dioxide - Nervous system diseases
141. The fraction of the total volume occupied by the atoms present in a simple cube is
(Solid State)
1) $\frac{\pi}{4}$
2) $\frac{\pi}{6}$
3) $\frac{\pi}{3 \sqrt{2}}$
4) $\frac{\pi}{4 \sqrt{2}}$
142. A solution containing 10.2 g glycerine per litre is isotonic with a $2 \%$ solution of glucose. What is the molecular mass of glycerine?
1) 91.8 g
2) 1198 g
3) 83.9 g
4) 890.3 g
143. same amount of electric current is passed through the solutions of $\mathrm{AgNO}_{3}$ and HCl . If 1.08 g of silver is obtained from $\mathrm{AgNO}_{3}$ solution, the amount of hydrogen liberated at STP will be (Electro Chemistry)
1) 1.008 g
2) 11.2 g
3) 0.01 g
4) 1.1 g
144. During electrolysis of a solution of $\mathrm{AgNO}_{3}, 9650$ coulombs of charge is passed through the solution. what will be the mass of silver deposited on the cathode?
(Electro Chemistry)
1) 108 g
2) 10.8 g
3) 1.08 g
4) 216 g
145. The decomposition of dinitrogen pentoxide $\left(\mathrm{N}_{2} \mathrm{O}_{5}\right)$ follows first order rate law. what will be the rate constant from the given data ? At $t=800 \mathrm{~s},\left[\mathrm{~N}_{2} \mathrm{O}_{5}\right]=1.45 \mathrm{~mol} \mathrm{~L}^{-1}$
At $t=1600 \mathrm{~s},\left[\mathrm{~N}_{2} \mathrm{O}_{5}\right]=0.88 \mathrm{~mol} \mathrm{~L}^{-1}$
(Chemical Kinetics)
1) $3.12 \times 10^{-4} \mathrm{~s}^{-1}$
2) $6.24 \times 10^{-4} \mathrm{~s}^{-1}$
3) $2.84 \times 10^{-4} \mathrm{~s}^{-1}$
4) $8.14 \times 10^{-4} \mathrm{~s}^{-1}$
146. The hydrolysis of ethyl acetate, $\mathrm{CH}_{3} \mathrm{COOC}_{2} \mathrm{H}_{5}+\mathrm{H}_{2} \mathrm{O} \xrightarrow{\mathrm{H}^{+}} \mathrm{CH}_{3} \mathrm{COOH}+\mathrm{C}_{2} \mathrm{H}_{5} \mathrm{OH}$ is a reaction of
(Chemical Kinetics)
1) zero order
2) pseudo first order
3) second order
4) third order
147. Mixing of positively charged colloidal solution with negatively charged colloidal solution brings $\qquad$ The decreasing order of coagulating power of $\mathrm{Na}^{+}, \mathrm{BA}^{+2}$ and $\mathrm{Al}^{3+}$ for negatively charged solution is $\qquad$ $-1$
(Surface Chemistry)
1) mutual coagulation , $\mathrm{Na}^{+}>\mathrm{Ba}^{2+}>\mathrm{Al}^{3+}$
2) mutual coagulation $\mathrm{Al}^{3+}>\mathrm{Ba}^{2+}>\mathrm{Na}^{+}$
3) coagulation $\mathrm{Na}^{+}>\mathrm{Ba}^{2+}>\mathrm{Al}^{3+}$
4) Peptization, $\mathrm{Al}^{3+}>\mathrm{Ba}^{2+}>\mathrm{Na}^{+}$
148. Blister copper is
(Genral Principles and Process of Isolation of elements)
1) impure copper
2) Obtained in self - reduction process during bessemerisation
3) Both are correct
4) None is correct
149. Mark the correct statements about halogens
(P-Block Elements)
1) Electron affinity of halogens is in the order $\mathrm{F}>\mathrm{Cl}>\mathrm{Br}>\mathrm{I}$.
2) HF is the strongest hydrohalic acid
3) $\mathrm{F}_{2}$ has lower bond dissociation energy than $\mathrm{Cl}_{2}$
4) All halogens show variable oxidation states.
150. The halogen that is most easily reduced is
(P-Block Elements)
1) $F_{2}$
2) $\mathrm{Cl}_{2}$
3) $\mathrm{Br}_{2}$
4) $I_{2}$
151. Composition of mischmental is
(d-and -f-block elements)
1) $5 \%$ of a lanthanoid metal, $95 \%$ of iron and traces of S,C Ca and Al
2) $95 \%$ of an actinoid metal, $5 \%$ of iron and traces of S, C, Ca and AI
3) $95 \%$ of a lanthanoid metal, $5 \%$ of iron and traces of S, C, Ca and AI
4) $95 \%$ of a transition metal, $5 \%$ of iron and traces of S, C, Ca and Al
152. The magnitude of magnetic moment (Spin only) of $\left[\mathrm{NiCl}_{4}\right]^{2-}$ will be
(Co-ordination Compounds)
1) 2.82 B.M
2) $3.25 \mathrm{~B} . \mathrm{M}$
3) 1.23 B.M
153. An alkyl halide, $R X$ reacts with $K C N$ to give propane nitrile. $R X$ is
4) 5.64 B.M
(HaloAlkanes \& Halo Arenes)
5) $\mathrm{C}_{3} \mathrm{H}_{7} \mathrm{Br}$
6) $\mathrm{C}_{4} \mathrm{H}_{9} \mathrm{Br}$
7) $\mathrm{C}_{2} \mathrm{H}_{5} \mathrm{Br}$
8) $\mathrm{C}_{5} \mathrm{H}_{11} \mathrm{Br}$
154. The major product obtained on interaction of phenol with sodium hydroxide and carbon dioxide is
(Alcohols, Phenols and ethers)
1) benzoic acid
2) salicylaldehyde
3) salicylic acid
4) phthalic acid
155. Carboxylic acids dimerise due to
1) High molecular weight2) Coordinate bonding
2) Intermolecular hydrogen bonding
3) covalent bonding
156. What are the correct step to convert acetaldehyde to acetone? (Aldehydes, Ketones \& Carboxylic acids)
1) $\mathrm{CH}_{3} \mathrm{MgBr}, \mathrm{H}_{2} \mathrm{O}$, Oxidation
2) Oxidation, $\mathrm{Ca}(\mathrm{OH})_{2}$, Heat
3) Reduction, KCN, Hydrolysis
4) Oxidation, $\mathrm{C}_{2} \mathrm{H}_{5} \mathrm{ONa}$, Heat
157. The Hinsberg test of a compound, $\mathrm{C}_{5} \mathrm{H}_{14} \mathrm{~N}_{2}$ produces a solid that is insoluble in $10 \%$ aq. NaOH , This solid derivative dissolves in $10 \%$ aqueous sulphuric acid. Which of the following would best describe these facts?
(Amines)
1) $\mathrm{NH}_{2} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{~N}\left(\mathrm{CH}_{3}\right)_{2}$
2) $\mathrm{NH}_{2} \mathrm{CH}_{2} \mathrm{C}\left(\mathrm{CH}_{3}\right)_{2} \mathrm{CH}_{2} \mathrm{NH}_{2}$
3) $\left(\mathrm{CH}_{3}\right)_{2} \mathrm{NCH}_{2} \mathrm{CH}_{2} \mathrm{NHCH}_{3}$
158. Thymine is
4) $\left(\mathrm{CH}_{3}\right)_{2} \mathrm{NCH}_{2} \mathrm{~N}\left(\mathrm{CH}_{3}\right)_{2}$
(Bio Molecules)
5) 5 -methyluracil
6) 4 - methyluracil
159. In vulcanization of rubber
3) 3 - methyluracil
4) 1-methyluracil
5) Sulphur reacts to form a new compound
6) Sulphur cross - links are introduced
7) Sulphur forms a very thin protective layer over rubber
8) All statements are correct
160. What is tincture of iodine?
1) 2-3\% solution of iodine in alcohol - water mixture.
2) A mixture of iodine in chloroxylenol.
3) A mixture of $0.2 \%$ phenol and $2-3 \%$ iodine in water
4) $2-3 \%$ solution of iodine in potassium iodide

## MODEL PAPER -9

## CHEMISTRY

121. A solution is prepared by adding 5 g of a solute ' $X$ ' to 45 g of solvent ' $Y$ ' what is the mass per cent of the solute
' $X$ '?
(Some Basic concept of chemistry)
1) $10 \%$
2) $11.1 \%$
3) $90 \%$
4) $75 \%$
122. How many orbitals and electrons are associated with $n=4$ ?
(Structure of Atom)
1) 32,64
2) 16,32
3) 4,16
4) 8,16
123. An electron is in one of the 3 d - orbitals. what are the possible values of $\mathrm{n}, \ell$ and m for this electron
(Structure of Atom)
1) $n=3, \ell=0, m_{\ell}=0$
2) $\mathrm{n}=3, \ell=1, \mathrm{~m}_{\ell}=-1,0,+1$
3) $n=3, \ell=2, m_{\ell}=-2,-1,0,+1,+2$
4) $n=3, \ell=3, m_{\ell}=-3,-2-1,0,+1,+2,+3$
(Classification of elements)
124. Which is the most electropositive element?
3) Cs
4) Ca
125. According to molecular orbital theory, which of the following will not exist?
(Chemical Bonding \& Molecular structure)
1) $\mathrm{H}^{+}{ }_{2}$
2) $\mathrm{Be}_{2}$
3) $B_{2}$
4) $\mathrm{C}_{2}$
126. Which of the following species has unpaired electrons
(Chemical Bonding \& Molecular structure)
1) $\mathrm{N}_{2}$
2) $\mathrm{F}_{2}$
3) $\mathrm{O}_{2}^{-}$
4) $\mathrm{O}^{2-}{ }_{2}$
127. What is the variation of $Z$ with pressure ?
2) At high pressures, all gases show $Z>1$
3) At very low pressures, all gases show $Z=1$
4) At intermediate pressures, all gases show $Z<1$
5) All of the above.
128. The unit of a in van der waals equation, $\left(P+\frac{a n^{2}}{V^{2}}\right)(V-n b)=n R T$ is
(States of Matter)
1) $\mathrm{atm} \mathrm{L}^{2} \mathrm{~mol}^{-2}$
2) $\mathrm{atm} \mathrm{L} \mathrm{mol}^{-2}$
3) $\mathrm{atm} \mathrm{L} \mathrm{mol}^{-1}$
4) $\operatorname{atm} \mathrm{L}^{2} \mathrm{~mol}^{-1}$
129. Two reactions given below: $\mathrm{C}_{\text {(graphite) }}+\mathrm{O}_{2(\mathrm{~g})} \rightarrow \mathrm{CO}_{2(\mathrm{~g})} ; \Delta \mathrm{H}=-393.7 \mathrm{~kJ}$;
$\mathrm{C}_{\text {(diamond) }} \rightarrow \mathrm{C}_{\text {(graphite) }} ; \Delta \mathrm{H}=-2.1 \mathrm{~kJ}$ what quantity of diamond will give 800 kJ of heat on burning ?
(Thermodynamics)
1) 24.25 g
2) 15.24 g
3) 2 g
4) 12.12 g
130. The solubility product of $\mathrm{BaCl}_{2}$ is $3.2 \times 10^{-9}$, what will be its solubility in mol $\mathrm{L}^{-1}$ ?
(Equilibrium)
1) $4 \times 10^{-3}$
2) $3.2 \times 10^{-9}$
3) $1 \times 10^{-3}$
4) $1 \times 10^{-9}$
131. Fluorine is best oxidising agent because
(Redox Reactions)
1) It is most electronegative
2) It has highest reduction potential
3) It has highest oxidation potential
4) It has smallest size.
132. Which species is acting as a reducing agent in the following reaction?

$$
14 \mathrm{H}^{+}+\mathrm{Cr}_{2} \mathrm{O}_{7}^{2-}+3 \mathrm{Ni} \rightarrow 2 \mathrm{Cr}^{3+}+7 \mathrm{H}_{2} \mathrm{O}+3 \mathrm{Ni}^{2+}
$$

(Redox Reactions)

1) $\mathrm{Cr}_{2} \mathrm{O}_{7}^{2-}$
2) Ni
3) $\mathrm{H}^{+}$
4) $\mathrm{H}_{2} \mathrm{O}$
133. Hydrolysis of $\mathrm{SiCl}_{4}$ gives
1) $\mathrm{Si}(\mathrm{OH})_{4}$
2) $\mathrm{SiOCl}_{2}$
3) $\mathrm{SiO}_{2}$
134. The difference of water molecules in gypsum and plaster of paris is
4) $\mathrm{H}_{2} \mathrm{SiO}_{4}$
(Hydrogen)
$\begin{array}{ll}\text { 1) } \frac{5}{2} & \text { 2) } 2\end{array}$
5) $\frac{1}{2}$
6) $1 \frac{1}{2}$
135. Compete the following reactions:
(i) $\mathrm{SiO}_{2}+2 \mathrm{NaOH} \rightarrow \mathrm{X}+\mathrm{H}_{2} \mathrm{O}$
(ii) $\mathrm{SiO}_{2}+4 \mathrm{HF} \rightarrow \mathrm{Y}+2 \mathrm{H}_{2} \mathrm{O}$
(iii) $\mathrm{Si}+2 \mathrm{CH} 3 \mathrm{Cl} \xrightarrow[570 \mathrm{~K}]{\text { Cu Powder }} \mathrm{Z}$
(P-Block elements)
1) $\mathrm{X}-\mathrm{Na}_{2} \mathrm{SiO}_{3}, \mathrm{Y}-\mathrm{SiF}_{4}, \mathrm{Z}-\left(\mathrm{CH}_{3}\right)_{2} \mathrm{SiCl}_{2}$
2) $X-\mathrm{H}_{2} \mathrm{SiO}_{3}, \mathrm{Y}-\mathrm{SiF}_{2}, \mathrm{Z}-\mathrm{CH}_{3} \mathrm{SiCl}_{3}$
3) $\mathrm{X}-\mathrm{Na}_{2} \mathrm{SiO}_{3}, \mathrm{Y}-\mathrm{H}_{2} \mathrm{SiO}_{3}, \mathrm{Z}-\left(\mathrm{CH}_{3}\right)_{3} \mathrm{SiCl}$
4) $\mathrm{X}-\mathrm{Na}_{2} \mathrm{SiO}_{3}, \mathrm{Y}-\mathrm{H}_{2} \mathrm{SiF}_{4}, \mathrm{Z}-\left(\mathrm{CH}_{3}\right)_{2} \mathrm{SiCl}_{2}$
136. A type of zeolite used to convert alcohols directly into gasoline is
(P-Block elements)
1) Zeolite $A$
2) Zeolite L
3) Zeolite Beta
4) ZSM - 5
137. In Lassaigne's test for $N, S$ and halogens, the organic compound is (Organic chemistry-some Basic Principle)
1) Fused with sodium
2) dissolved with sodamide
3) extracted with sodamide
4) Fused with calcium
138. What is the carbon - carbon bond length in benzene ?
(Hydro Carbons)
1) $1.20^{\circ} \mathrm{A}$ and $1.31^{\circ} \mathrm{A}$
2) $1.39{ }^{\circ} \mathrm{A}$
3) $1.39{ }^{\circ} \mathrm{A}$ and $1.20^{\circ} \mathrm{A}$
4) $1.20^{\circ} \mathrm{A}$
139. The following reaction is known as $\mathrm{C}_{6} \mathrm{H}_{6}+\mathrm{CH}_{3} \mathrm{Cl} \xrightarrow[\text { (anhy.) }]{\mathrm{AlCl}_{3}} \mathrm{C}_{6} \mathrm{H}_{5} \mathrm{CH}_{3}+\mathrm{HCl}$
(Hydro Carbons)
1) Wurtz - Fitting reaction
2) Friedel - Crafts reaction
3) Rosenmund reaction
4) Sandmeyer reaction
140. Eutrophication causes
(Environmental Chemistry)
1) Increase in nutrients
2) Increase in dissolved salts
3) reduction in dissolved oxygen
4) Reduction in water pollution
141. The density of a metal which crystallises in bcc lattice with unit cell edge length 300 pm and molar mass 50 g $\mathrm{mol}^{-1}$ will be
(Solid State)
1) $10 \mathrm{~g} \mathrm{~cm}^{-3}$
2) $14.2 \mathrm{~g} \mathrm{~cm}^{-3}$
3) $6.15 \mathrm{~g} \mathrm{~cm}^{-3}$
4) $9.32 \mathrm{~g} \mathrm{~cm}^{-3}$
142. Which of the following will have same value of van't Hoff factor as that of $\mathrm{K}_{4}\left[\mathrm{Fe}(\mathrm{CN})_{6}\right]$ ?
(Solutions)
1) $\mathrm{Al}_{2}\left(\mathrm{SO}_{4}\right)_{3}$
2) $\mathrm{AlCl}_{3}$
3) $\mathrm{Al}\left(\mathrm{NO}_{3}\right)_{3}$
4) $\mathrm{Al}(\mathrm{OH})_{3}$
143. The amount of chlorine evolved by passing 2 A of current in an aqueous solution of NaCl for 30 minutes is
(Electro Chemistry)
1) 2.64 g
2) 1.32 g
3) 3.62 g
4) 4.22 g
144. If 54 g of silver is deposited during an electrolysis reaction, how much aluminium will be deposited by the same amount of electric current?
(Electro Chemistry)
1) 2.7 g
2) 4.5 g
3) 27 g
4) 5.4 g
145. Rate of which reaction increases with tempeature?
(Chemical Kinetics)
1)Exothermic reaction
2) Endothermic reaction 3) Any of the above
3) None of the above
146. The activation energy in a chemical reaction is defined as
(Chemical Kinetics)
1) The difference in energies of reactants and products
2) The sum of energies of reactants and products
3) The difference in energy of intermediate complex with the average energy of reactants and products
4) The difference in energy of intermeidate complex and the average energy of reactants
147. The separation of an emulsion into its constituent liquids is known as
(Surface Chemistry)
1) Emulsification
2) Protection of colloid
3) Coagulation
4) Demulsification
148. Which of the following slags is produced during extraction of iron?
(Genral Principles and Process of Isolation of elements)
1) $\mathrm{CaSiO}_{3}$
2) $\mathrm{FeSiO}_{3}$
3) $\mathrm{MgSiO}_{3}$
4) $\mathrm{ZnSiO}_{3}$
149. Fluorine is the best oxidising agent because it has
(P-Block Elements)
1) highest electron affinity
2) highest reduction potential
3) highest oxidation potential
4) lowest electron affinity
150. The correct order of acidity of oxoacids of halogens is
(P-Block Elements)
1) $\mathrm{HClO}<\mathrm{HClO}_{2}<\mathrm{HClO}_{3}<\mathrm{HCOO}_{4}$
2) $\mathrm{HClO}_{4}<\mathrm{HClO}_{3}<\mathrm{HClO}_{2}<\mathrm{HClO}$
3) $\mathrm{HClO}<\mathrm{HClO}_{4}<\mathrm{HClO}_{3}^{3}<\mathrm{HClO}_{2}^{4}$
4) $\mathrm{HClO}_{4}<\mathrm{HClO}_{2}<\mathrm{HClO}_{3}<\mathrm{HClO}$
151. The correct configuration of f-block elements is
(d-and-f-block elements)
1) $(n-2) f^{1-14}(n-1) d^{0-1} n s^{2}$
2) $(n-1)^{1-14}(n-1) d^{0-1} n s^{2}$
3) $(n-3) f^{1-14}(n-2) d^{0-1}(n-1) s^{2}$
4) $(n-2) f^{0-1}(n-1) d^{0-1} n s^{2}$
152. Which of the following complexes will have tetrahedral shape?
(Co-ordination Compounds)
1) $\left[\mathrm{PdCl}_{4}\right]^{2-}$
2) $\left[\mathrm{Pd}(\mathrm{CN})_{4}\right]^{2-}$
3) $\left[\mathrm{Ni}(\mathrm{CN})_{4}\right]^{2-}$
4) $\left[\mathrm{NiCl}_{4}\right]^{2-}$
153. Elimination of bromine from 2-bromobutane results in the formation of
(HaloAlkanes \& Halo Arenes)
1) Equimolar mixture of 1 and 2-butene
2) Predominantly 2-butene
3) Predominantly 1-butene
4) Predominantly 2-butyne
154. Consider the following reaction Phenol $\xrightarrow{\text { Zndust }} X \xrightarrow[\text { anhyd. } \mathrm{AlCl}_{3}]{\mathrm{CH}_{3} \mathrm{Cl}} Y \xrightarrow{\text { alkaline } K \mathrm{KMO}_{4}} Z$. The product $Z$ is
(Alcohols, Phenols and ethers)
1) Benzaldehyde
2) Benzoic acid
3) Benzene
4) Toluene
155. In a set of the given reactions, acetic acid yielded a product $C$
$\mathrm{CH}_{3} \mathrm{COOH}+\mathrm{PCl}_{5} \rightarrow \mathrm{~A} \xrightarrow[\text { Anh. }^{\mathrm{AlCl}}{ }_{3}]{\mathrm{C}_{6} \mathrm{H}_{6}} \mathrm{~B} \xrightarrow[\text { ether }]{\mathrm{C}_{2} \mathrm{H}_{5} \mathrm{MgBr}} \mathrm{C}$. Product C would be (Aldehydes, Ketones \& Carboxylic acids)
1) $\mathrm{CH}_{3} \mathrm{CH}(\mathrm{OH}) \mathrm{C}_{2} \mathrm{H}_{5}$
2) $\mathrm{CH}_{3} \mathrm{COC}_{6} \mathrm{H}_{5}$
3) $\mathrm{CH}_{3} \mathrm{CH}(\mathrm{OH}) \mathrm{C}_{6} \mathrm{H}_{5}$
4) C

156. What happens when a carboxylic acid is treated with lithium aluminium hydride?
(Aldehydes, Ketones \& Carboxylic acids)
1) Aldehyde is formed
2) Primary alcohol is formed 3) Ketone is formed
3) Grignard reagent is formed
157. $\mathrm{C}_{6} \mathrm{H}_{6} \xrightarrow[\mathrm{H}_{2} \mathrm{SO}_{4}]{\mathrm{HNO}_{3}} \mathrm{P} \xrightarrow{\mathrm{Sn} / \mathrm{HCl}} \mathrm{Q} \xrightarrow[\mathrm{HCl}]{\mathrm{NaNO}_{2}} \mathrm{P} \xrightarrow[\mathrm{H}_{2} \mathrm{O}]{\mathrm{H}_{3} \mathrm{PO}_{2}} \mathrm{~S}$. The end product $S$ in the given sequence of reactions is
1) Benzoic acid
2) Benzene
3) Phenol
4) Chlorobenzene
(Amines)
158. A nucleoside on hydrolysis gives
1) An aldopentose and a nitrogenous base
2) An aldopentose and phosphoric acid
3) An aldopentose, anitrogenous base and phosphoric acid 4) A nitrogenous base and phosphoric acid
159. Low density polythene (LDP) is used in the insulation of electricity carrying wires and manufacture of flexible pipes and squeeze bottles because
(Polymers)
1) It is tough, hard and rigid
2) It is chemically inert, tough, flexible and poor conductor of electricity
3) It is very tough, good conductor of electricity and flexible
4) It is chemically inert, very soft, water absorbent and poor conductor of heat
160. The use of aspartame is limited to cold foods and drinks because
(Chemistry in everyday life)
1) It is unstable to heat and decomposes at cooking temperature
2) It is 500 times sweeter than cane sugar
3) It becomes bitter at cooking temperature
4) It reacts with the food at cooking temperature

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## MODEL PAPER - 10

## CHEMISTRY

121. In a reaction conatiner, 100 g of hydrogen and $100 \mathrm{~g} \mathrm{of} \mathrm{Cl}_{2}$ are mixed for the formation of HCl gas, what is the limiting reagent and how much HCl is formed in the reaction?
(Some Basic concept of chemistry)
1) $\mathrm{H}_{2}$ is limiting reagent and 36.5 g of HCl are formed
2) $\mathrm{Cl}_{2}$ is limiting reagent and 102.8 g of HCl are formed.
3) $\mathrm{H}_{2}$ is limiting reagent and 142 g of HCl are formed
4) $\mathrm{Cl}_{2}$ is limiting reagent and 73 g of HCl are formed.
122. Few electrons have following quantum numbers,
(i) $n=4, I=1$
(ii) $n=4, I=0$
(iii) $n=3, I=2$
(iv) $\mathrm{n}=3, \mathrm{I}=1$

Arrange them in the order of increasing energy from lowest to highest.
(Structure of Atom)

1) (iv) < (ii) < (iii) < (i)
2) (ii) < (iv) < (i) < (iii)
3) (i) < (iii) < (ii) < (iv)
4) (iii) < (i) < (iv) < (ii)
123. The number of radial nodes and angular nodes for $d$ - orbital can be represented as
(Structure of Atom)
1) $(n-2)$ radial nodes +1 angular node $=(n-1)$ total nodes
2) $(n-1)$ radial nodes +1 angular node $=(n-1)$ total nodes
3) $(\mathrm{n}-3)$ radial nodes +2 angular nodes $=(n-\ell-1)$ total nodes
4) $(n-3)$ radial nodes +2 angular nodes $=(n-1)$ total nodes
124. Which of the following groups conatins metals, non-metals and metalloids? (Classification of elements)
1) Group 17
2) Group 14
3) Group 13
4)Group 12
125. Which of the following has strongest bond?
(Chemical Bonding \& Molecular structure)
1) HF
2) HCl
3) HBr
4) HI
126. Hydrogen bond between two atoms is formed due to
(Chemical Bonding \& Molecular structure)
1) Displacement of electrons towards more electronegative atom resulting in fractional positive charge on hydrogen
2) Displacement of electrons towards hydrogen atom resulting in a polar molecule
3) Formation of a bond between hydrogen atoms of one molecule and the other
4) Existence of an attractive force which binds hydrogen atoms together
127. It is observed that $\mathrm{H}_{2}$ and He gases always show positive deviation from ideal behaviour i.e., $Z>1$. This is because
(States of Matter)
1) The value of a is very large due to high attractive forces
2) The weak intermolecular forces of attraction due to which a is very small and $a / V^{2}$ is negligible
3) The value of $b$ is very large due to large size of the molecules
4) Both a and $b$ are very small and negligible
128. Surface tension does not vary with
(States of Matter)
1) temperature
2) concentration
3) size of the surface
4) vapour pressure.
129. Which of the following relationships is not correct?
(Thermodynamics)
1) $\Delta H=\Delta E+\Delta n_{g} R T$
2) $\Delta \mathrm{H}_{\text {sub }}=\Delta \mathrm{H}_{\text {fusion }}+\Delta \mathrm{H}_{\text {vap }}$
3) $\Delta \mathrm{H}_{r}^{0}=\Sigma \mathrm{H}_{\mathrm{f} \text { (reactants) }}^{0}-\Sigma \mathrm{H}_{\mathrm{f} \text { (products) }}^{0}$
4) $\Delta \mathrm{H}^{0}{ }_{r}=\Sigma$ B.E of reactants $-\Sigma$ B.E of products
130. Solubility product expression of salt $\mathrm{MX}_{4}$ which is sparingly soluble with a solubility $s$ can be given as
1) $256 \mathrm{~s}^{5}$
2) $16 \mathrm{~s}^{3}$
3) 5 s
4) $25 \mathrm{~s}^{4}$
(Equilibrium)
131. Which of the following halides is most easily oxidised?
(Redox Reactions)
1) $\mathrm{F}^{-}$
2) $\mathrm{Br}{ }^{-}$
3) $I^{-}$
4) $\mathrm{Cl}^{-}$
132. Given $\mathrm{E}_{\mathrm{Ag}^{+} / \mathrm{Ag}}^{0}=+0.80 \mathrm{~V} ; \mathrm{E}_{\mathrm{Cu}^{2+} / \mathrm{Cu}}^{0}=+0.34 \mathrm{~V} ; \mathrm{E}_{\mathrm{Fe}^{+3} / \mathrm{Fe}^{+2}}^{0}=+0.76 \mathrm{~V} ; \mathrm{E}_{\mathrm{Ce}^{+4} / \mathrm{Ce}^{+3}}^{0}=+1.60 \mathrm{~V}$ which of the following statements is not correct?
(Redox Reactions)
1) $\mathrm{Fe}^{3+}$ does not oxidise $\mathrm{Ce}^{3+}$
2) Cu reduces $\mathrm{Ag}+$ to Ag
3) Ag will reduce $\mathrm{Cu}^{2+}$ to Cu
4) $\mathrm{Fe}^{3+}$ reduces $\mathrm{Cu}^{2+}$ to Cu
133. Strength of 10 volume hydrogen peroxide solution means
(Hydrogen)
1) $30.35 \mathrm{~g} \mathrm{~L}^{-1}$
2) $17 \mathrm{~g} \mathrm{~L}^{-1}$
3) $34 \mathrm{~g} \mathrm{~L}^{-1}$
4) $68 \mathrm{~g} \mathrm{~L}^{-1}$
134. Slaked lime reacts with chlorine to give
1) $\mathrm{CaCl}_{2}$
2) CaO
3) $\mathrm{Ca}(\mathrm{OCl})_{2}$
135. Glass and cement are two important examples of
1) Man - made silcates
2) Silicates
3) Zeolites
) Man-made silcates 2) Silicates 3) Zeolites
4) $\mathrm{CaCO}_{3}$
(S-Block elements)
(P-Block elements)
136. Which of the following acids cannot be stored in glass?
(P-Block elements)
2) HCl
3) $\mathrm{H}_{2} \mathrm{SO}_{4}$
$\begin{array}{ll}\text { 13) } \\ \text { 37. } \\ 2.18 \mathrm{~g} & \text { 2) } \mathrm{HCl} \\ \text { an organic compound containing sulphur produces } 1.02 \mathrm{~g} \text { of } \mathrm{BaSO}_{4} \text {. THe percentage of sulphur in }\end{array}$
4) organic polymers the compound is
5) $7.26 \%$
6) $8.98 \%$
7) $10 \%$
8) $6.42 \%$
138. Which of the following species does not show aromaticity?
(Hydro Carbons)
1) 


2)

3)

4)

139. Similar to alkenes and alkynes benzene also undergoes ozonolysis. In the sequence of the given reaction identify X and Y .
(Hydro Carbons)


1) $X=$ Triozonide, $Y=$ Glyoxal
2) $X=$ Diozonide, $Y=$ Succinic acid
3) $X=$ Monoozonide, $Y=$ Benzoic acid
4) $X=$ Triozonide, $Y=$ Benzaldehyde
140. As DDT passes into food chain, its concentration
(Environmental Chemistry)
1) Remains same
2) Decreases
3) Becomes zero
4) Increases
141. Which of the following crystals does not exhibt Frenkel defect?
(Solid State)
1) AgBr
2) AgCl
3) KBr
4) ZnS
142. What amount of $\mathrm{CaCl}_{2}(\mathrm{i}=2.47)$ is dissolved in 2 litres of water so that its osmotic pressure is 0.5 atm at $27^{\circ} \mathrm{C}$ ?
1) 3.42 g
2) 9.24 g
3) 2.834 g
4) 1.820 g
143. In electrolysis of dilute $\mathrm{H}_{2} \mathrm{SO}_{4}$, what is liberated at anode?
1) $\mathrm{H}_{2}$
2) $\mathrm{SO}_{4}{ }^{2-}$
3) $\mathrm{SO}_{2}$
144. When a lead storage battery is discharged
2) Oxygen gas is evolved
3) Lead sulphate is consumed
4) Lead sulphate is formed
5) Lead sulphide is formed
145. Which of the following factors are resonsible for the increase in the rate of a surface catalysed reaction?
(Chemical Kinetics)
i) A catalyst provides proper orientation for the reactant molecules to react
ii) Heat of adsorption of reactants on a catalyst helps reactant molecules to overcome activation energy.
iii) The catalyst increases the activation energy of the reaction
1) i \& iii
2) i \& ii
3) ii \& iii
4) i , ii \& iii
146. Threshold energy is equal to

Chemical Kinetics)
(Chem
2) Activation energy - Energy of molecules
4) None of these

1) Activation energy
147. What is the role of adsorption in froth floatation process used especially for concerntration of sulphide ores?
(Surface Chemistry)
1) Shape selective catalysis
2) Adsorption of pine oil on sulphide ore particles
3) Adsorption of pine oil on impurities
4) Production of heat in the process of exothermic reaction
148. Most electropositive metals are obtained from their ores by (Genral Principles and Process of Isolation of elements)
1) Autoreduction
2) Smelting with carbon
3) Electrolysis of fused salts 4)
) Thermal decomposition
149. In $\mathrm{XeF}_{2}, \mathrm{XeF}_{4}$ and $\mathrm{XeF}_{6}$ the number of lone pairs on Xe is respectively
(P-Block Elements)
1) $2,3,1$
2) $1,2,3$
3) $4,1,2$
4) $3,2,1$
150. Compound with the geometry square pyramidal and $s p^{3} d^{2}$ hybridisation is
(P-Block Elements)
1) $\mathrm{XeOF}_{2}$
2) $\mathrm{XeOF}_{4}$
3) $\mathrm{XeO}_{4}$
4) $\mathrm{XeO}_{2} \mathrm{~F}_{2}$
151. What is the total number of inner transition elements in the periodic table?
1) 10
2) 14
3) 30
4) 28
(Co-ordination Compounds)
152. Mark the incorrect match
4) Chlorophyll - Chromium
5) Insulin - Zinc
6) Haemoglobin - Iron
7) Vitamin $B_{12}$ - Cobalt
153. Chloroform is kept in dark coloured bottles because
(HaloAlkanes \& Halo Arenes)
1) It reacts with clear glass
2) It undergoes chlorination in transparent glass bottles
3) It is oxidised to poisonous gas, phosgene in sunlight 4) It starts burning when exposed to sunlight
154. Cumene on reaction with oxygen followed by hydrolysis gives
(Alcohols, Phenols and ethers)
1) $\mathrm{CH}_{3} \mathrm{OH}$ and $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{COCH}_{3}$
2) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{OH}$ and $\left(\mathrm{CH}_{3}\right)_{2} \mathrm{O}$
3) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{OCH}_{3}$ and $\mathrm{C}_{3} \mathrm{OH}$
4) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{OH}$ and $\mathrm{CH}_{3} \mathrm{COCH}_{5}$
155. Which of the following will not undergo HVZ reaction?
(Aldehydes, Ketones \& Carboxylic acids)
1) Propanoic acid
2) Ethanoic acid
3) 2-Methylpropanoic acid
4) 2,2-Dimethylpropanoic acid
156. Which of the following orders is not correct for the decreasing order of acidic characer?
(Aldehydes, Ketones \& Carboxylic acids)
1) $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}(\mathrm{Cl}) \mathrm{COOH}>\mathrm{CH}_{3} \mathrm{CH}(\mathrm{Cl}) \mathrm{CH}_{2} \mathrm{COOH}>\mathrm{CH}_{2}\left(\mathrm{ClI}_{2} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{COOH}>\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{COOH}\right.$
2) $\mathrm{ICH}_{2} \mathrm{COOH}>\mathrm{BrCH}_{2} \mathrm{COOH}>\mathrm{CICH}_{2} \mathrm{COOH}>\mathrm{FCH}_{2} \mathrm{COOH}$
3) $\mathrm{CCl}_{3} \mathrm{COOH}>\mathrm{CHCl}_{2} \mathrm{COOH}>\mathrm{CH}_{2} \mathrm{ClCOOH}>\mathrm{CH}_{3} \mathrm{COOH}$
4) $\mathrm{HCOOH}>\mathrm{CH}_{3} \mathrm{COOH}>\mathrm{C}_{2} \mathrm{H}_{5} \mathrm{COOH}>\left(\mathrm{CH}_{3}\right)_{2} \mathrm{CHCOOH}$
157. The product ' $D$ ' in the following sequence of reactions is

1) 2,4,6-tribromofluorobenzene
2) Flurobenzene
3) p-bromofluorobenzene
4) tribromobenzene
158. Which of the following is not produced by human body?
(Bio Molecules)
1) Enzymes
2) Vitamins
3) Proteins
4) Nucleic acid
159. Synthetic biopolymer, PHBV is made up of the following monomers
(Polymers)
1) 3-hydroxybutanoic acid + 3-hydroxypentanoic acid 2) 2-hydroxybutanoic acid + 2-hydroxypropanoic
2) 3-chlorobutanoic acid +3-chloropentanoic acid 4) 2-chlorobutanoic acid+3-methylpentanoic acid
160. Which is not true for a detergent molecule?
(Chemistry in everyday life)
1) It has a non-polar organic part and a polar group
2) It is not easily biodegraded
3) It is a sodium salt of fatty acid
4) It is a surface active reagent
