# *MANU VATIKA SCHOOL, BUDHLADA*
# *CHEMISTRY XII MCQs*

**NAME_____ ROLL NO_____ STREAM**

(1.) Which one of the following electrolytes has the same value of Van't Hoff factor (i) as that of $Al_2(SO_4)_3$ (if all are 100% ionized))

(a.) $K_4[Fe(CN)_6]$ (b.) $K_2SO_4$

(c.) $K_3[Fe(CN)_6]$ (d.) $Al(NO_3)_3$

**(2.)** Maximum amount of a solid solute that can be dissolved in a specific amount of a given liquid solvent does not depend upon—

(a.) temperature (b.) nature of solute

(c.) pressure (d.) nature of solvent

**(3.)** If solute and solvent interactions are more than solute-solute and solvent-solvent interaction then

(a.) it is ideal solution. (b.) it is non-ideal solution with position deviation.

(c.) it is non-ideal solution with negative deviation. (d.) can't be predicted.

**(4.)** When $40$ g of substance is dissolved in $1000$ g of water, its freezing point is depressed by $1.86^oC$. Kf for water is $1.86^o$C mol$^{-1}$ then find the molar mass of the solute

(a.) 4 (b.) 10

(c.) 40 (d.) 400

**(5.)** **Assertion:** When a solution is separated from the pure solvent by a semipermeable membrane, the solvent molecules pass through it from pure solvent side to the solution side.

**Reason:** Diffusion of solvent occurs from a region of high concentration solution to a region of low concentration solution.

(a.) Both A and R are true and R is the correct explanation of A. (b.) Both A and R are true but R is not the correct explanation of A.

(c.) A is true but R is false. (d.) Both A and R are false.

**(6.)** In water saturated air the mole fraction of water vapour is 0.02. If the total pressure of the saturated air is 1.2 atm, the partial pressure of dry air is

(a.) 1.18 atm (b.) 1.76 atm

(c.) 1.176 atm (d.) 0.98 atm

**(7.)** Matrix match.

| **Column 1** | **Column 2** |
|---|---|
| **(A)** Standard | (p) Solution with two solution components |
| **(B)** Solid solution | (q) A solution which contains maximum amount of solute that can be dissolved in a given amount of solvent at given temperature |
| **(C)** Binary solution | (r) A solution in solid phase |

(a.) $A \to P, B \to Q, C \to R$ (b.) $A \to Q, B \to R, C \to P$

(c.) $A \to R, B \to P, C \to Q$ (d.) $A \to R, B \to Q, C \to P$

**(8.)** According to Henry law, the amount of gas that will dissolve in blood plasma or any other liquid is determined by which of these factors

(a.) Solubility of the gas in the liquid (b.) The total pressure of the gas mixture

(c.) pH of the liquid (d.) The osmotic pressure of the gas mixture

**(9.)** The freezing point depression constant for water is $-1.86^o$cm$^{-1}$. If $5.0$ g $Na_2SO_4$ is dissolved in $45$ g$H_2O$, the freezing point is changed by $-3.82^oC$. Calculate Van't Hoff factor for $Na_2SO_4$:

(a.) 2.05 (b.) 2.63

(c.) 3.1l (d.) 0.381

**(10.)** vapour phase diagram for a solution is given below if dotted lines represent deviation.
The correct observation for this solution

(a.) $\Delta H_{mix}$: positive (b.) $\Delta S_{mix}$: positive

(c.) $\Delta V_{mix}$: positive (d.) All of these

**(11.)** Osmotic pressure of a solution at a given temperature

(a.) increase with concentration (b.) decrease with concentration

(c.) remain same (d.) initially increase and then decrease

**(12.)** Read statements **[**

I. Semipermeable membrane contains network of submacroscopic holes or pores.

II. Semipermeable membrane appears to be continuous sheets or films.

III. Solvent molecule cannot pass through the holes of semipermeable membrane but solute molecule can pass.

On the basis of the statements given above select correct option

(a.) Only (I) (b.) Only (II)

(c.) Only (III) (d.) All of these

**(13.)** The vapour of a solution having $2.0$ g of solute X (molar atomic mass$= 32$ g mol$^{-1}$) in $100$ g of $CS_2$(vapour pressure $= 854$torr) is $848.9$ torr. The molecular formula of solute is

(a.) $X$ (b.) $X_2$

(c.) $X_4$ (d.) $X_8$

**(14.)** The Van't Hoff factor of $0.1$M$Ba(NO_3)_2$ solution is 2.74. The degree of dissociation is

(a.) 91.3% (b.) 87%

(c.) 100% (d.) 74%

**(15.)** The vapour pressure of two liquids P and Q are 80 and 60 torr respectively. The total vapour pressure of solution obtained by mixing 3 mole of P and 2 mole of Q would be

(a.) 72 torr (b.) 140 torr

(c.) 68 torr (d.) 20 torr

**(16.)** The units of ebullioscopic constant is

(a.) K kg$^{-1}$mol$^{-1}$or$K$(molality) (b.) mol kg$K^{-1}$or$K^{-1}$(molality)

(c.) kg mol$^{-1}K^{-1}$or$K^{-1}$(molality) (d.) K mol kg$^{-1}$or$K$(molality)

**(17.)** Of the following 0.10 m aqueous solutions, which one will exhibit the largest freezing point depression?

(a.) KCl (b.) $C_6H_{12}O_6$

(c.) $Al_2(SO_4)_3$ (d.) $K_2SO_4$

**(18.)** An aqueous solution of sugar is taken in a beaker. At freezing point of solution **,**

(a.) Crystals of sugar separated (b.) Crystals of glucose and fructose are separated

(c.) Crystals office separated (d.) Mixture of ice and some sugar crystals separated

**(19.)** Which one of the following binary mixtures forms an azeotrope with minimum boiling type

(a.) acetone— ethanol (b.) $H_2O - HNO_3$

(c.) benzene— toluene (d.) n-hexane—n-heptane

**(20.)** How many grams of $CH_3OH$ should be added to water to prepare 150 ml solution of $2M$$CH_3OH$

(a.) $9.6 \times 10^3$ (b.) $2.4 \times 10^3$

(c.) 9.6 (d.) 2.4

**(21.)** Relationship between partial pressure & mole fraction is

(a.) Graham's law (b.) Raoult's law

(c.) Le-Chatelier (d.) Avogadro's law

**(22.)** 4L of 0.02M aqueous solution NaCl was diluted by adding one litre of water. The molality of resultant solution is—

(a.) 0.004 (b.) 0.008

(c.) 0.012 (d.) 0.016

**(23.)** Iodine and sulphur dissolve in

(a.) $H_2O$ (b.) benzene

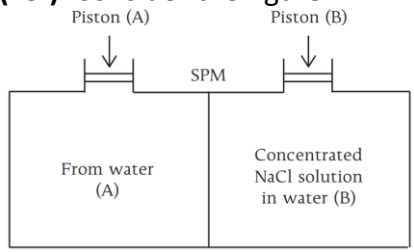
(c.) $CS_2$ (d.) ethanol

**(24.)** 19.5 g of $CH_2FCOOH$ is dissolved in $500$ gof water. The depression in the freezing point of water observed is $1.0^oC$. Calculate Van't Hoff factor.

(a.) 2.97 (b.) 0.79

(c.) 6.28 (d.) 1.0753

**(25.)** Consider the figure




Mark the correct statement

(a.) water will move from side (A) to side (B) if a pressure lower than osmotic pressure is applied on piston (B).

(b.) Water will move from side (B) to side (A) if a pressure greater than osmotic pressure is applied on piston (B).

(c.) The value of molal depression constant depends on nature of solvent.

(d.) Relative lowering of vapour pressure is a dimensionless quantity.

**(26.)** $P_A$ and $P_B$ are the vapour pressure of pure liquid components A and B respectively of an ideal binary solution. If $X_A$ represent the mole fraction of component A, the total pressure of the solution will be —

(a.) $P_A + X_A(P_B - P_A)$ (b.) $P_A + X_A(P_A - P_B)$

(c.) $P_B + X_A(P_B - P_A)$ (d.) $P_B + X_A(P_A - P_B)$

**(27.)** Nalorphene $(C_{19}H_{21}NO_3)$, similar to morphine, is used to combat withdrawal symptoms in narcotic users. Dose of nalorphene generally given is 1.5 mg. Calculate the mass of $1.5 \times 10^{-3}$ m aqueous solution required for the above dose

(a.) 9.2 g (b.) 4.2 g

(c.) 3.2 g (d.) 6.2 g

**(28.)** **Assertion:** Azeotropic mixture are formed only by non-ideal solution.

**Reason:** Boiling point of an azeotropic mixture is either higher or lower than both the components of solution.

(a.) Both A and R are correct and R is correct explanation of A.

(b.) Both A and R are correct but R is not correct explanation of A.

(c.) A is true but R is false.

(d.) Both A and R are false.

**(29.)** If molality of a dilute solution is double, the value of molal depression constant $(K_f)$ will be?

(a.) Halved (b.) tripled

(c.) unchanged (d.) doubled

**(30.)** Solid solution in which the solute is gas

(a.) copper dissolved in gold (b.) camphor in nitrogen gas

(c.) solution of hydrogen in palladium (d.) all of the above

**(31.)** In hydrogen-oxygen fuel cell, combustion of hydrogen occurs to

(a.) Produce high purity water (b.) Create potential difference between two electrodes

(c.) generate hear (d.) remove adsorbed oxygen from electrode surface

**(32.)** Fluorine is a best oxidising agent because it has

(a.) highest electron affinity (b.) highest $E°_{red}$

(c.) highest $E^o_{oxid}$ (d.) lowest electron affinity

**(33.)** (180.) $E^o$ for the half cell $Zn^{2+}/Zn$ is $-0.76$ emf of the cell $Zn/Zn^{2+}(1M)||2H^+(1M)|H_2(1\text{ atm})$is

(a.) $-0.76V$ (c.) $-0.38V$

(b.) $+0.76$ (d.) $+0.38V$

**(34.)** The electrolyte used in Leclanche cell is

(a.) Paste of KOH and ZnO (b.) 38% solution of $H_2SO_4$

(c.) Moist paste of $NH_4Cl$ and $ZnCl_2$ (d.) Moist NaOH

**(35.)** **Assertion:** $E_{Ag^+/Ag}$ increases with increase in concentration of $Ag^+$ ions.

**Reason:** $E_{Ag^+/Ag}$ has a positive value.

(a.) Both and R are true and R is correct explanation of A. (b.) Both A and R are true and R is not correct explanation of A.

(c.) A is true but R is false. (d.) Both A and R are false.

**(36.)** Hydrogen electrode is placed in the solution where pH is 10. The potential of this electrode will be

(a.) $+0.591$ V (b.) $-0.591$ V

(c.) $0$ V (d.) none of these

**(37.)** For a reaction

$$A(s) + 2B^+ \rightarrow A^{2+} + 2B(s)$$

$K_C$ has been found to be $10^{12}$. The $E^o_{cell}$ is

(a.) $0.354$ V (b.) $0.708$ V

(c.) $0.0098$ V (d.) $1.36$ V

**(38.)** The order of equivalent conductance at infinite dilution of LiCl, NaCl and KCl?

(a.) LiCl $>$ NaCl $>$ KCl (b.) KCl $>$ NaCl $>$ LiCl

(c.) NaCl $>$ KCl $>$ LiCl (d.) LiCl $>$ KCl $>$ NaCl

**(39.)** The reference electrode is made by using

(a.) $ZnCl_2$ (b.) $CuSO_4$

(c.) $HgCl_2$ (d.) $Hg_2Cl_2$

**(40.)** Which one of the following is a strong electrolyte? **[Page: 81]**

(a.) $Ca(NO_3)_2$ (b.) HCN

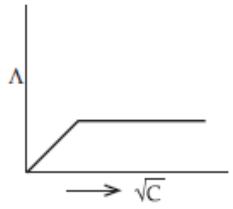
(c.) $H_2SO_3$ (d.) $NH_4OH$

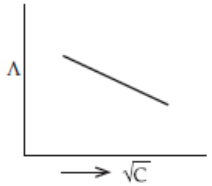
**(41.)** Which of the following decrease on dilution of electrolyte solution?

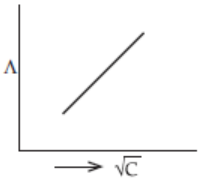
(a.) equivalent conductance (b.) molar conductance

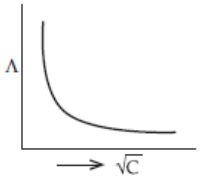
(c.) specific conductance (d.) conductance

**(42.)** The variation of equivalent conductance of strong electrolyte with concentration is correctly shown in which figure

(a.) 


(b.) 


(c.) 


(d.) 


**(43.)** The quantity of charge required to obtain one mole of aluminum from $Al_2O_3$ is

(a.) 1 P (b.) $6\,F$

(c.) $3\,F$ (d.) $2\,F$

**(44.)** Electrolysis of $H_2SO_4$ (conc.) gives the following at anode?

**(A)** $H_2$ **(B)** $O_2$ **(C)** $H_2S_2O_3$ **(D)** $H_2S_2O_8$

(a.) $\Lambda = \frac{X\times1000}{0.1}$ (b.) $\Lambda = \frac{2\times1000}{X\times0.1}$

(c.) $\Lambda = \frac{X\times1000}{0.5}$ (d.) $\Lambda = \frac{0.5}{1000X}$

**(45.)** Using the data given below find out the strong oxidising agent

$E^{\circ}_{Cl_2O_7^2/Cr^{3+}} = 1.33V$ $E^{o}_{Cl_2/Cl^-} = 1.36V$

$E^{o}_{MnO_4/Mn^{2+}} = 1.51V$ $E^{o}_{Cr^{3+}/Cr} = -0.74V$

(a.) $Cl^-$ (c.) $MnO_4^-$

(b.) $Mn^{2+}$ (d.) $Cr^{3+}$

**(46.)** $E^o$ for the cell $Zn|Zn^{2+}(aq)||Cu^{2+}(aq)/Cuisl.\,10V$ at $25^{\circ}C$ is 1. 10V at $25^oC$. The equilibrium constant for the cell reaction

$Zn + Cu^{2+}(aq) \rightleftharpoons Cu + Zn^{2+}(aq)$ is of the order of

(a.) $10^{-37}$ (b.) $10^{37}$

(c.) $10^{-17}$ (d.) $10^{17}$

**(47.)** When dil.$HNO_3$ is electrolysed

(a.) $H_2(g)$ is formed at anode (b.) $O_2(g)$ is formed at anode

(c.) $NO_2$ is formed at anode (d.) $N_2$ is formed at anode

**(48.)** The equivalent conductivity of a solution containing $2.54$ g of $CuSO_4$ per litre is $91\Omega^{-1}cm^2eq^{-1}$. Its conductivity would be

(a.) $2.9\times10^{-3}\Omega^{-1}cm^{-1}$ (b.) $1.8\times10^{-2}\Omega^{-1}cm^{-1}$

(c.) $2.4\times10^{-4}\Omega^{-1}cm^{-1}$ (d.) $3.6\times10^{-3}\Omega^{-1}cm^{-1}$

**(49.)** Prevention of corrosion of iron by zinc coating is called

(a.) electrolysis (b.) Photoelectrolysis

(c.) cathodic protection (d.) galvanization

**(50.)** Which of the following is not an anodic reaction?

(a.) $Ag^+ \rightarrow Ag - e^-$ (b.) $Cu \rightarrow Cu^{2+} + 2e^-$

(c.) $Fe^{2+} \rightarrow Fe^{3+} + e^-$ (d.) $4OH^- \rightarrow 2H_2O + O_2 + 4e^-$

**(51.)** When $0.1$ mol $MnO_4^{2-}$ is oxidised the quantity of electricity required to completely oxidise $MnO_4^{2-}$ to $MnO_4^-$ is

(a.) $96500$ C (b.) $2\times96500C$

(c.) $9650$ C (d.) $96.50$ C

**(52.)** The oxidation potential of a hydrogen electrode at pH $= 1$ is $(T = 298K)$

(a.) $0.059$ V (b.) O

(c.) $-0.059$ V (d.) $0.59$ V

**(53.)** On the basis of $E^{\circ}$ values, the strongest oxidizing agent is

$[Fe(CN)_6]^4 \rightarrow [Fe(CN)_6]^{3-} + e^-; E^{\circ} = -0.35V$

$Fe^{2+} \rightarrow Fe^{3+} + e^-; E^{\circ} = -0.77V$

(a.) $Fe^{3+}$ (c.) $[Fe(CN)_6]^{4-}$

(b.) $[Fe(CN)_6]^{3-}$ (d.) $Fe^{2+}$

**(54.)** Molar conductance $(\Lambda_m^o)$ at infinite dilution of NaCl,HCl and $CH_3COONa$ are 126.4, 425.9 and $91.0$ $Scm^2mol^{-1}$ resp.

$\Lambda_m^o$ for $CH_3COOH$ will be

(a.) $425.5Scm^2mol^{-1}$ (b.) $180.5Scm^2mol^{-1}$

(c.) $290.8Scm^2mol^{-1}$ (d.) $390.5Scm^2mol^{-1}$

**(55.)** The passage of electricity in the Daniel cell when Zn and Cu electrodes are connected is:

(a.) From Cu to Zn in the cell
(b.) From Cu to Zn outside the cell
(c.) From Zn to Cu outside the cell
(d.) In any direction of cell

**(56.)** KCl is used in salt bridge because

(a.) it forms a good jelly with agar-agar
(b.) it is a strong electrolyte
(c.) it is a good conductor of electricity
(d.) the transference number of $K^+$ and $Cl^-$ ions are almost equal

**(57.)** The cell constant of a conductivity cell —

(a.) changes with change of electrolyte
(b.) changes with change of concentration of electrolyte
(c.) change with temperature of electrolyte
(d.) remains constant for a cell

**(58.)** The number of electrons delivered at the cathode during the electrolysis by a current of 1 A in 60 seconds is (charge one electron $= 1.6 \times 10^{-19} C$)

(a.) $6 \times 10^{23}$
(b.) $6 \times 10^{20}$
(c.) $3.75 \times 10^{20}$
(d.) $7.48 \times 10^{23}$

**(59.)** The specific conductance in ohm$^{-1}$cm$^{-1}$ of four electrolytes P, Q, R and S are given below:

$$P = 5 \times 10^{-5}$$
$$Q = 7 \times 10^{-8}$$
$$R = 1 \times 10^{-10}$$
$$S = 9.2 \times 10^{-3}$$

The one that offers highest resistance to the passage of current is

(a.) P
(b.) S
(c.) R
(d.) Q

**(60.)** Which of the following is a cathode $R \times N$?

(a.) $Fe^{2+} \rightarrow Fe^{3+}$
(b.) $4OH^- \rightarrow 2H_2O + O_2$
(c.) $2H_2O \rightarrow 2OH^- + H_2$
(d.) $2SO_4^{2-} \rightarrow S_2O_8^{2-}$

**(61.)** Among the transition metals of 3d-series, the one that has the highest negative $M^{2+}/M$ standard electrode potential is

(a.) Ti
(b.) Cu
(c.) Mn
(d.) Ni

**(62.)** Compute the given reaction of $KMnO_4$ in acidic medium:

$$5Fe^{2+} + MnO_4^- + 8H^+ \rightarrow Mn^{2+} + 4H_2O + 5X$$
$$5S^{2-} + 2MnO_4^- + 16H^+ \rightarrow 2Mn^{2+} + 8H_2O + 5Y$$
$$ZNO_2^- + 2MnO_4^- + 6H^+ \rightarrow 2Mn^{2+} + ZNO_3^- + 3H_2O$$

X, Y and Z are respectively

(a.) Fe, $S^{2+}, 6$
(b.) $Fe^{3+}, S, 7$
(c.) $Fe^{3+}, S, 5$
(d.) $Fe^{2+}, S^{2+}, 5$

**(63.)** Solution of oxalate is colourless. It is made acidic by adding exceeds of $H^+$, then titrated with $KMnO_4$. Now at a moment if someone has added large amount of $KMnO_4$ in it then the possible products are

(a.) $CO_2$,$Mn^{2+}$, $H_2O$
(b.) $CO_2$,$MnO_2$, $H_2O$
(c.) $MnO_2$, $H_2O$,$CO_2$
(d.) $CO_2$,$MnO_{2f} H_2O$,$Mn^{2+}$

**(64.)** Which of the comparison regarding Zn, Cd, Hg is/ are incorrect⟩.

I $ZnCl_2$ is ionic whereas $CdCl_2$ and $HgCl_2$ are covalent.
II Zn and Cd dissolves in dilute acid (HCl) liberating $H_2$ but Hg cannot.
III Zn and Cd forming white ppt. of $Zn(OH)_2$ and $Cd(OH)_2$ but Hg form coloured ppt. of $Hg(OH)_2$.

(a.) I & III
(b.) I & II
(c.) II & III
(d.) only I

**(65.)** The silver UK coins are

(a.) Cu/Zn alloy
(b.) Cu/Ni alloy
(c.) Ag/Ni alloy
(d.) Ag/Au alloy.

**(66.)** Match the following.

| | |
|---|---|
| (P) Radioactive lanthanoid | (I) Eu |
| (Q) Lanthanoid which has $4f^7$ in $+2$ oxidation state | (II) La |
| (R) Lanthanoid which has $4f^7$ in $+3$ oxidation state | (III) Pm |
| (S) Lanthanoid which has $4f^0$ in $+3$ oxidation state | (IV) Gd |

(a.) P-III,Q-I,R-IV,S-II (b.) P-III,Q-IV,R-I,S-II

(c.) P-I,Q-IILR-IV,S-II (d.) P-II,Q-III,R-IV,S-I

**(67.)** The melting point of copper is higher than that of zinc because

(a.) the atomic structure of copper is much denser than zinc (b.) the atomic volume of copper is high

(c.) involvement of lesser number of electrons in metallic bonding (d.) involvement of $(n-1)$ d electrons in metallic bonding.

**(68.)** What happens when KCl is heated with $H_2SO_4$ and potassium dichromate?

(a.) $CrO_2Cl_2$ is formed. (b.) $CrCl_3$ is formed.

(c.) $K_2CrO_4$ is formed. (d.) $Cr_2(SO_4)_3$ is formed.

**(69.)** Consider the given statements:

I In its higher oxidation states, manganese forms stable compounds with oxygen and fluorine.

II $Mn^{3+}$ and $Co^{3+}$ are oxidising agents in aqueous solution.

III $Ti^{2+}$ and $Cr^{2+}$ are reducing agents in aqueous solution.

Which of the given statement(s) is/are correct

(a.) I only (b.) I & II only

(c.) II & III only (d.) all of these

**(70.)**Electronic configuration of Cu is given as $[\boldsymbol{Ar}]\ 3d^{10}4s^2$. Then which of the following is correct about Cu$(I)$ and Cu(II)?

(a.) E.C. of Cu$(I)$ is $3d^9$ and Cu(II) is $3d^{10}$. (b.) Cu(II) is more stable than Cu$(I)$.

(c.) Cu$(I)$ and Cu(II) are equally stable. (d.) Stability of Cu$(I)$ and Cu(II) depends on nature of copper salts.

**(71.)Assertion:** The highest oxidation state of osmium is $+6$.

**Reason:** Osmium is a 6d-block element.

(a.) Both A and R are correct and R is correct explanation of A. (b.) Both A and R are correct but R is not correct explanation of A.

(c.) A is true but R is false. (d.) Both A and R are false.

**(72.)Assertion:** Separation of Zr and Hf is difficult.

**Reason:** Both have same chemical properties due to similar radius

(a.) Both A and R are correct and R is correct explanation of A. (b.) Both A and R are correct but R is not correct explanation of A.

(c.) A is true but R is false. (d.) Both A and R are false.

**(73.)**The separation of lanthanides by ion exchange method is based on

(a.) size of the ions (b.) the solubility of their nitrates

(c.) oxidation states of the ions (d.) basicity of the hydroxides of lanthanides.

**(74.)**Which of the following ions show higher spin only magnetic moment value

(a.) $Ti^{3+}$ & $Mn^{2+}$ (b.) $Mn^{2+}$ & $Ti^{3+}$

(c.) $Mn^{2+}$ & $Fe^{2+}$ (d.) $Co^{3+}$ & $Mn^{2+}$

**(75.)**Manganese exhibit its highest oxidation state $(+7)$ in its oxide not in its fluoride, why.

(a.) Oxygen is less electronegative than fluorine. (b.) Oxygen posses $d$ -orbitals while fluorine does nor.

(c.) Fluorine stabilises lower oxidation state.

(d.) In covalent compounds fluorine can form single bond only while oxygen forms double bonds.

**(76.)** Which of the following factors is responsible for the value of ionisation enthalpy.

(a.) Attraction of each electron towards nucleus

(b.) Repulsion between the electrons

(c.) Exchange energy

(d.) All of these

**(77.)** Transition elements show magnetic moment due to presence of unpaired electrons. Which of the following pairs have same magnetic moment?

(a.) $Co^{2+}$,$Cr^{2+}$,

(b.) $Cr^{2+}$,$Mn^{2+}$

(c.) $Mn^{2+}$,$Cr^{3+}$

(d.) $Co^{2+}$,$Cr^{3+}$

**(78.)** When a mixture of NaCl and $K_2Cr_2O_7$ is gently warmed with contracted $H_2SO_4$, then

(I) Chlorine gas is evolved

(II) Orange red vapours are evolved

(III) The vapours when passed into NaOH solution give a yellow solution of $Na_2CrO_4$

Which of the following is/are correct

(a.) I only

(b.) II & III

(c.) I & III

(d.) All are correct

**(79.)** The reason for greater range of oxidation stare in actinoids is attributed to

(a.) the radioactive nature of actinoids

(b.) actinoid contraction

(c.) 5f, 6d and 7s levels having comparable energies

(d.) 4f and 5d levels being close in energies.

**(80.)** General electronic configuration of lanthanoids is

(a.) $(n-2)f^{1-14}(n-1)s^2p^6d^{0-1}ns^2$

(b.) $(n-2)f^{10-14}(n-1)d^{0-1}ns^2$

(c.) $(n-2)f^{0-14}(n-1)d^{10}ns^2$

(d.) $(n-2)d^{0-1}(n-1)f^{1-14}ns^2$

**(81.)** Which of the following coordination compound is also known as heteroleptic complex?

(a.) $[Co(NH_3)_6]^{3+}$

(b.) $[Co(NH_3)_4Cl_2]^{+}$

(c.) $[PtCl_4]^{2-}$

(d.) $[Cu(CN)_4]^{3-}$

**(82.)** The crystal field stabilisation energy (CFSE) for $[COCl0]^{4-}$ is $15000cm^{-1}$. The CFSE for $[CoCl_4]^{2-}$will be

(a.) $6000cm^{-1}$

(b.) $16000cm^{-1}$

(c.) $18000cm^{-1}$

(d.) $8000cm^{-1}$

**(83.)** Match the Column I with Column II and select the correct codes given below.

| **Column I** | **Column II** |
|---|---|
| **Complex** | **IUPAC name** |
| (P) $[\boldsymbol{Co(H_2NCH_2\,CH_2NH_2)_3}]_2SO_4$ | (i) Pentaaminine carbonatocobalt (III) chloride |
| (Q) $[Co(NH_3)_5(CO_3)]Cl$ | (ii) Tris(ethane-1,2 -diammine) cobalt (III) sulphate |
| (R) $[CoCl_2(en)_2]Cl$ | (iii) Dichloridobis (ethane-1,2-diammine) cobalt (III) chloride |
| (S) $[CoCl_2(en)_2]^+$ | (iv) Dichloridobis (ethane-1,2-diammione) cobalt (III) |

(a.) P-(i),Q-(ii),R-(iii),S-(iv)

(b.) P-(iv),Q-(iii),R-(ii),S-(i)

(c.) P-(ii),Q-(i),R-(iii),S-(iv)

(d.) P-(iii),Q-(ii),R-(i),S-(iv)

**(84.)** Due to the presence of ambidentate ligands coordination compounds show isomerism. Palladium complexes of the type $[Pd(C_6H_5)_2(SCN)_2]$ and $[Pd(C_6H_5)_2(NCS)_2]$ are

(a.) linkage isomers

(b.) coordination isomers

(c.) ionisation isomers

(d.) geometrical isomers

**(85.)** Which of the following formula belongs to Mohr's salt?

(a.) $KCl \cdot MgCl_2 \cdot 6H_2O$

(b.) $FeSO_4 \cdot (NH_4)_2SO_4 \cdot 6H_2O$

(c.) $KAl(SO_4)_2 \cdot 12H_2O$

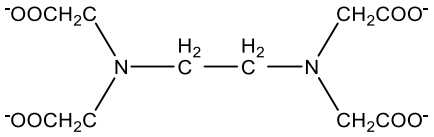
(d.) None of these

**(86.)** Match the column I with column II and select the correct code given below

| Column I | Column II |
|---|---|
| **Hybridisation** | **Geometry** |
| (P) $sp^3$ | (i) Tetrahedral |
| (Q) dsp2 | (ii) Square planar |
| (R) $sp^3d$ | (iii) Trigonal bipyramidal |
| (S) $sp^3d^2$ | (iv) Octahedral |

(a.) P-(i),Q-(ii),R-(iii),S-(iv)
(b.) P-(i),Q-(iii),R-(iv),S-(ii)
(c.) P-(iii),Q-(iv),R-(ii),S-(i)
(d.) P-(ii),__O-(i),R-(iii),S-(iv)

**(87.)**




The given compounds is

(a.) hexadenate ligand.
(b.) pentadentate ligand.
(c.) tetradentate ligand.
(d.) didenate ligand.

**(88.)** What is the oxidation state of the compound tetracarbonyl nickel?

(a.) Zero
(b.) One
(c.) Two
(d.) Four

**(89.)** Which of the metal carbonyl have metal $(M)$ −metal (M) bond?

(a.) $[Fe(CO)_5]$
(b.) $[Cr(CO)_6]$
(c.) $[Ni(CO)_4]$
(d.) $[Mn_2(CO)_{10}]$

**(90.)** Some statements are given below regarding coordination complexes. Select the correct statement.
(I) $[MnCl_6]^{3-}$ has outer orbital complex.
(II) $[FeF_6]^{3-}$ involve $sp^3d^2$ hybridisation.
(III) $[CoF_6]^{3-}$ has paramagnetic in nature.

(a.) I, II and III
(b.) II and III
(c.) I and III
(d.) I and II

**(91.)** Which of the following compounds show linkage isomerism

(a.) $[Co(NH_3)_5(NO_2)]Cl_2$
(b.) $[Co(NH_3)_6][Cr(CN)_6]$
(c.) $[Co(NH_3)_5SO_4]Br$
(d.) $[Cr(H_2O)_6]Cl_3$

**(92.)** What are the coordination number of $d^2sp^3$ and $sp^3d^2$ hybridised complex respectively?

(a.) 2 and 6
(b.) 4 and 6
(c.) 6 and 6
(d.) 6 and 4

**(93.)** What is the coordination number of the complex $[Fe(C_2O_4)_3]^{3-}$?

(a.) 4
(b.) 6
(c.) 2
(d.) 0

**(94.)** IUPAC name of the complex $[Cr(NH_3)_3(H_2O)_3]Cl_3$ is

(a.) triamminetriaquachromium(II) chloride
(b.) hexaamminerriaquachromium(III) chloride
(c.) diamminetriamminechromium(II) chloride
(d.) triamminetriaquachromium(III) chloride

**(95.)** 1 mol of $CoCl_3 \cdot 6NH_3$ gave how many mol of AgCl precipitate when it is treated with excess silver nitrate solution?

(a.) 3 mol of AgCl
(b.) 2 mol of AgCl
(c.) 1 mol of AgCl
(d.) 4 mol of AgCl

**(96.)** Match the metal ions given in column I with the spin magnetic moments of the given in column II and assign the correct code:

| Column I | Column II |
|---|---|
| (P) $Co^{3+}$ | (i) $\sqrt{8}B.M.$ |
| (Q) $Cr^{3+}$ | (ii) $\sqrt{35}B.M.$ |
| (R) $Fe^{3+}$ | (iii) $\sqrt{3}B.M.$ |
| (S) $Ni^{2+}$ | (iv) $\sqrt{24}B.M.$ |
| | (v) $\sqrt{15}B.M.$ |

P Q R S

(a.) (iv) (v) (ii) (i) (b.) (i) (ii) (iii) (iv)

(c.) (iv) (i) (ii) (iii) (d.) (iii) (v) (i) (ii)

**(97.)** Which of the following ligands form a chelate?

(a.) Acetate (b.) Oxalate

(c.) Cyanide (d.) Ammonia

**(98.)** Which of the following statement is correct with respect to $[Ni(CO)_4]$ and $[NiCl_4]^{2-}$

(a.) $[Ni(CO)_4]$ and $[NiCl_4]^{2-}$ both are square planar (b.) $[Ni(CO)_4]$ and $[NiCl_4]^{2-}$ both are tetrahedral

(c.) $[Ni(CO)_4]$ is tetrahedral while $[NiCl_4]^{2-}$ is square planar (d.) $[Ni(CO)_4]$ is square planar while $[NiCl_4]^{2-}$ is tetrahedral

**(99.)** Which of the following ligands is also considered as ambidentate ligand)

(a.) $C_2O_4^{2-}$ (b.) $NO_2^-$

(c.) $NH_3$ (d.) $H_2O$

**(100.)** Select the incorrect statement

(a.) Stereoisomerism have the same chemical formula and chemical bonds bur they have different spatial arrangement. (b.) $[Pt(NH_3)_2Cl_2]$ has cis and trans isomerism.

(c.) $[Co(NH_3)_4Cl_2]^+$ has only cis isomerism. (d.) Ionisation isomerism is a type of structural isomerism.

**(101.)** Crystal field theory explains

(a.) electrostatic model which considers the metal – ligand bond to be ionic. (b.) electrostatic model which considers the metal-ligand bond to be covalent.

(c.) electrostatic model which considers the metal-ligand bond to be ionic and covalent. (d.) none of these.

**(102.)** The correct IUPAC name of $[Pt(NH_3)_2Cl_2]$

(a.) diamminedichloridoplatinum (II) (b.) diamminedichloridoplatinum (IV)

(c.) diamminedichloridoplatinum (0) (d.) dichloridodiammineplatinum (IV)

**(103.)** Which of the following arrangement for spectrochemical series is incorrect?

(a.) $I^- < Br^- < SCN^- < Cl^-$ (b.) $S^{2-} < F^- < OH^- < C_2O_4^{2-}$

(c.) $en < CN^- < CO < NCS^-$ (d.) $edta^{4-} < NH_3 < en < CN^-$

**(104)** What is the correct IUPAC name of $[Ag(NH_3)_2]$ $[Ag(CN)_2]$?

(a.) Diammine silver(II) dicyanoargentate(II) (b.) Diammine silver(I) dicyanoargentate(I)

(c.) Diammine silver(0) dicyanosilver(II) (d.) Diammine silver(II) dicyanoargentate(0)

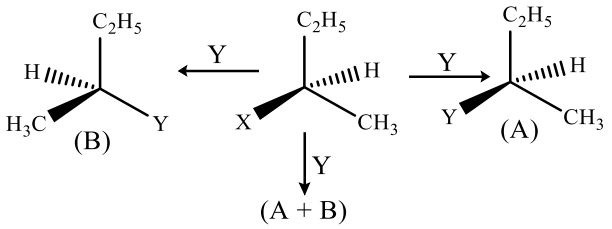
**(105) Assertion:** $[Cu(H_2O)_4]^{2+}$ absorb green light.

**Reason:** $[Co(NH_3)_5(H_2O)]^{3+}$ complementary colour is yellow.

(a.) Both Assertion and Reason are true and Reason is the best explanation of Assertion. (b.) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c.) Assertion is true but Reason is false. (d.) Both Assertion and Reason are false.

**(106.)** Consider the following reactions [Page: 307]




Here A+B is

(a.) Racemic mixture (b.) Inversion

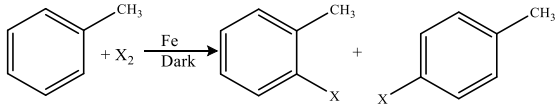
(c.) Retention (d.) None of these

**(107)** In which of the following solvents, the solubility of haloalkanes is low?

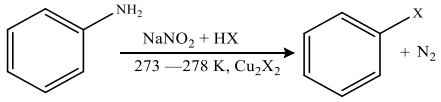
(a.) water (b.) ethanol

(c.) benzene (d.) chloroform

**(108.)** Which of the following reaction is Sandmeyer's reaction?

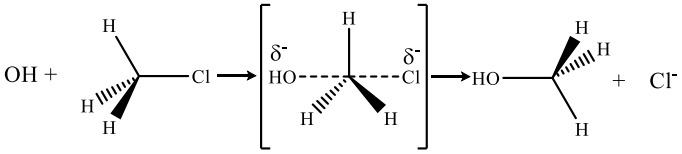
(a.) 


(b.) $\boldsymbol{H_3C - Br + AgF \longrightarrow H_3C - F + AgBr}$

(c.) 


(d.) $\boldsymbol{H_3C - X + NaI \longrightarrow H_3C - I + Nax}$

**(109.)** Consider the following reaction

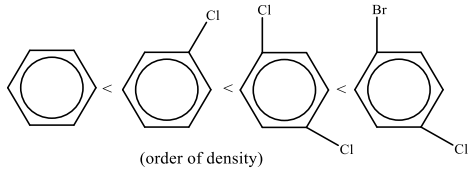


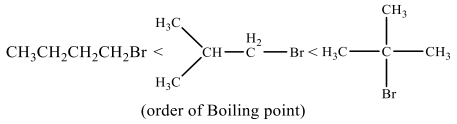

The reaction represents

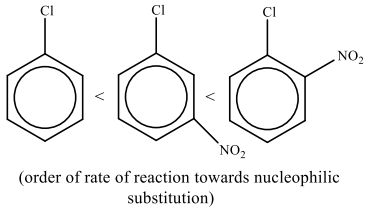
(a.) $S_N2$ mechanism (b.) $S_N1$ mechanism

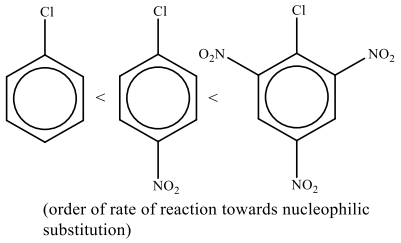
(c.) $S_Ni$ mechanism (d.) none of these

**(110.)** Which of the following is in correct

(a.) 


(b.) 


(c.) 


(d.) 


**(111.)** An alkyl chloride produces a single alkene on reaction with sodium ethoxide and ethanol. The alkene further undergoes hydrogenation to yield 2-methylbutane. Identify the alkyl chloride from amongst the following.

(a.) $ClCH_2(CH_3)_2CH_3$ (b.) $ClCH_2CH_2CH_2CH_3$

(c.) $ClCH_2CH(CH_3)CH_2CH_3$ (d.) $CH_3C(Cl)(CH_3)CH_2CH_3$

**(112.)** Which of the following statement is incorrect?

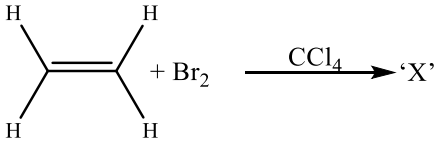
(a.) The common name of alkyl halides are derived by naming the alkyl group followed by the name of halide.

(b.) For monohalogen substituted derivatives of benzene, common and IUPAC names are used.

(c.) For dihalogen derivatives, the prefixes o-, mand p- are used in IUPAC system.

(d.) The dihaloalkanes having the same type of halogen atoms are named as alkylide.

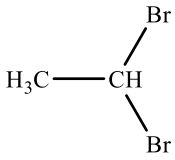
**(113.)** Consider the following reaction




Here, 'X' is

(a.) $\boldsymbol{Br\,CH_2 - CH_2\,Br}$

(b.) $\boldsymbol{CH_3\text{-}\,CH_2\,Br}$

(c.) 


(d.) both (a) and (b)

**(114.)** Carbon compounds containing more than one halogen atom are usually referred to as

(a.) polyhalogen compounds

(b.) hydrocarbon

(c.) haloalkane

(d.) haloarene

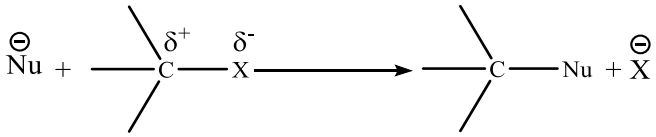
**(115.)** Match the organic compounds given in column I with their effects given in column II.

| **(Column I)** | **(Column I)** |
|---|---|
| **Organic compounds** | **Effects** |
| (I) Chloramphenicol | (p) treatment of malaria |
| (II) Thyroxine | (q) antibiotic |
| (III) Chloroquine | (r) Iodine containing hormone |
| (IV) Halothane | (s) Anaesthetic |

Codes

| | I | II | III | IV |
|---|---|---|---|---|
| (a.) | r | q | p | s |
| (b.) | p | q | r | s |
| (c.) | q | r | p | s |
| (d.) | p | q | s | r |

**(116.)** Consider the following reaction




The type of reaction shown by the reaction is

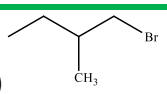
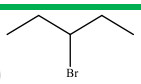
(a.) nucleophilic substitution

(b.) electrophilic substitution

(c.) addition reaction

(d.) elimination reaction

**(117.)** Match the following.

| **Column I (IUPAC)** | **(Name) Column II** |
|---|---|
| (i)   | (p) Bromobutane |
| (ii)   | (q) 1-Bromo-2-methylbutane |
| (iii)$CH_3 - CH_2CH_2CH_2\,Br$ | (r) 3-bromopentane |

Codes

I II III

(a.) r p q (b.) p q r

(c.) q p r (d.) q r p

**(118.)** $C_7H_8 \xrightarrow{3Cl_2,Heat} A \xrightarrow{Zn/Br_2} B \xrightarrow{Zn/HCl}$ , Here, the correct compound C is

(a.) 3-Bromo-2,4,6-trichlorotoluene (b.) o-bromotoluene

(c.) p-bromotoluene (d.) m-bromotoluene

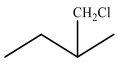
**(119.)** Aryl halides are extremely less reactive towards nucleophilic substitution reactions due to

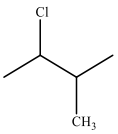
(a.) Resonance effect (b.) Difference in hybridisation

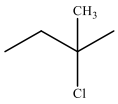
(c.) Instability of phenyl cation (d.) All of these

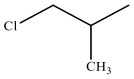
**(120.)** An alkene 'A' on reaction with $O_2$ and $Zn\ /H_2O$gives propanone and ethanol in equimolar ratio. Addition of HCl to alkene 'A' gives 'B' as the major product.

The structure of product 'B' is

(a.) 


(b.) 


(c.) 

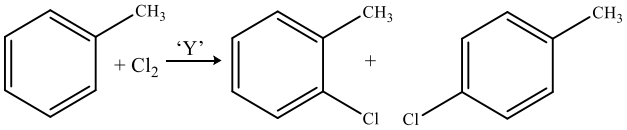

(d.) 


**(121.)** The number of isomers for the compound with molecular formula C2BrClFI is

(a.) 3 (b.) 4

(c.) 5 (d.) 6

**(122.)** The reagent 'Y' in the reaction is




(a.) $Fe\ dark$

(b.) $Fe\ +\ sunlight$

(c.) $FeCl_3$

(d.) $FeBr_3$

**(123.)** Thionyl chloride is preferred because

(a.) alkyl halide and $H_3PO_3$ formed (b.) alkyl halide is formed along with $SO_2$ and $HCl$ gas

(c.) alkyl halide and $POCl_3$are formed (d.) alkyl halide and $H_2O$are formed

**(124.)** Chlorination of toluene in presence of light and heat followed by treatment with aq. NaOH and acidification gives

(a.) o-cresol (b.) p-cresol

(c.) 2,4-dihydroxytoluene (d.) benzoic acid

**(125.)** The alkane that gives only one mono-chloro product on chlorination with $Cl_2$ in presence of diffused sunlight is

(a.) 2,2-dimethylbutane (b.) neopentane

(c.) n-pentane (d.) isopentane

**(126.)** **Assertion**: Both symmetrical and unsymmetrical ethers can be prepared by Williamson's synthesis.

**Reason**: Williamson's synthesis is an example of nucleophilic substitution reaction.

(a.) Both A and R are true and R is correct explanation of A. (b.) Both A and R are true but R is not correct explanation of A.

(c.) A is true but R is false. (d.) Both A and R are false.

**(127.)** **Assertion**: Alcoholic fermentation involves conversion of sugar into ethyl alcohol by yeast.

**Reason**: Fermentation involves the slow decomposition of complex organic compounds into simpler substances through complex nitrogenous compounds called enzymes.

(a.) Both A and R are correct and R is correct explanation of A.

(b.) Both A and R are correct but R is not correct explanation of A.

(c.) A is correct but R is incorrect.

(d.) Both A and R are false.

**(128.)** o-nitrophenol is steam volatile due to

(a.) van der Waal's forces of attraction

(b.) London forces of attraction

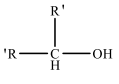
(c.) intermolecular H-bonding

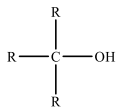
(d.) intramolecular H-bonding

**(129.)** The product obtained in the following reaction is

$$\boldsymbol{RCOR + R'MgX \longrightarrow \xrightarrow{H_2O} 'Y' + Mg(OH)_2}$$

(a.) $\boldsymbol{RCH_2OH}$

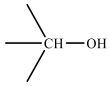
(b.) 

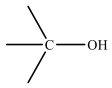
(c.) 

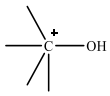
(d.) None of these

**(130.)** Which of the following is a tertiary alcohol?

(a.) $\boldsymbol{-CH_2OH}$

(b.) 

(c.) 

(d.) 

**(131.)** Reaction of phenol with chloroform in the presence of dilute sodium hydroxide finally introduces, which one of the following functional group?

(a.) $-CH_2Cl$

(b.) $-COOH$

(c.) $-CHCl_2$

(d.) $-CHO$

**(132.)** Consider the following steps involved in the mechanism of acid catalysed hydration

**(A)** Nucleophilic attack of $H_2O$ on carbocation

**(B)** Protonation of alkene to form carbocation

(C) Deprotonation to form an alcohol

The correct sequence of reaction mechanism is

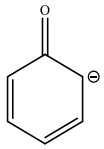
(a.) A, B, C

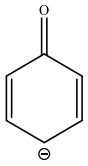
(b.) C, B, A

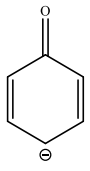
(c.) B, A, C

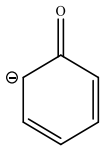
(d.) A, C, B

**(133)** Which of the following resonating structure of phenol is incorrect?

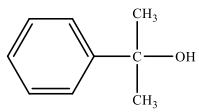
(a.) 

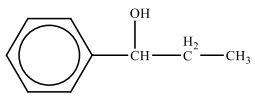
(b.) 

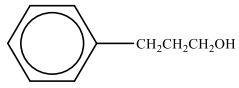
(c.) 

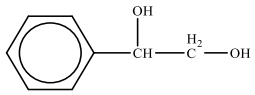
(d.) 

**(134.)** An alcohol of formula $C_9H_{12}O$ **(A)** reacts with $Na_2Cr_2O_7$ to form a compound having formula $C_9H_{10}O$. The original alcohol might be

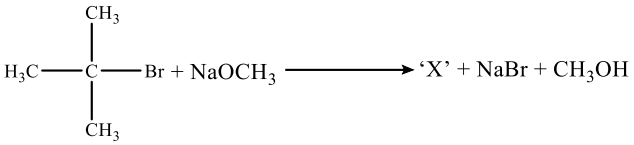
(a.) 

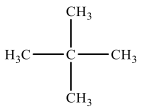
(b.) 

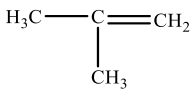
(c.) 

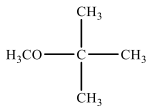
(d.) 

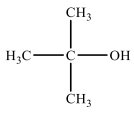
**(135.)** The product in the following reaction is [Page: 346]



(a.) 

(b.) 

(c.) 

(d.) 

**(136.)** Which of the following statement is correct?

(a.) The simplest hydroxy derivative of benzene is 2-methylphenol.

(b.) In case of phenol, the substituted compounds are termed as ortho, meta and para.

(c.) Trihydroxy derivatives of benzene are known as 1,2-, 1,3- and 1,4-benzenediol.

(d.) In case of ethers, alkyl or aryl groups are written in alphabetical order and adding the word ether.

**(137.)** Alcohols readily react both as

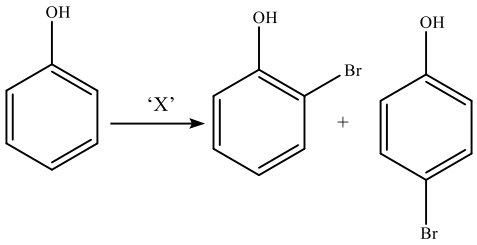
(a.) electrophiles

(b.) nucleophiles

(c.) Both (a) and (b)

(d.) None of these

**(138.)** Reagent used for following reaction is



(a.) $Br_2$ in $CS_2$

(b.) $Br_2$ in $CCl_4$

(c.) $Br_2$ in $CS_2$, 273 K

(d.) $Br_2$/water

**(139.)** Toluene of mono chlorination in presence of sunlight followed by hydrolysis in presence of aq. NaOH yields [NCERT Exemplar, Page: 332]

(a.) 2,4-dihydroxy toluene

(b.) benzyl alcohol

(c.) o-cresol

(d.) m-cresol

**(140.)** **Assertion**: $CH_3OH$ undergoes faster esterification than $(CH_3)_3COH$.

**Reason**: The reaction between an acid and alcohol in presence of dry HCl gas to give ester is known as esterification process. [Page: 337]

(a.) Both A and R are correct and R is correct explanation of A.

(b.) Both A and R are correct but R is not correct explanation of A.

(c.) A is correct but R is incorrect.

(d.) Both A and R are false.

**(141.)** Which of the following is not an electrophilic substitution reaction?

(a.) Nitration

(b.) Friedel–Crafts reaction

(c.) halogenation

(d.) Williamson synthesis

**(142.)** The given alcohol is $CH_2 = CH - OH$is

(a.) vinylic alcohol

(b.) allylic alcohol

(c.) benzylic alcohol

(d.) alkylic alcohol

**(143.)** Which of the following is a 'wood spirit'?

(a.) Ethanol

(b.) Propanol

(c.) Methanol

(d.) Butanol

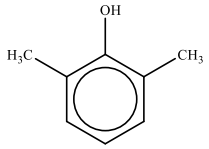
**(144.)** Consider the following statements:

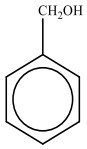
(I) In phenol, higher electronegativity of sp2 hydridised carbon to which –OH is attached.

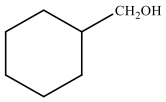
(II) In alkoxide ion, positive charge is localised on oxygen.
(III) In phenoxide ion, the charge is delocalized.
Choose the correct option:

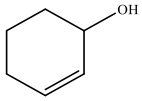
(a.) only I (b.) only III
(c.) only I and III (d.) I, II and III

**(145.)** The correct structure formula for vinylic phenol is

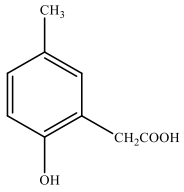
(a.) 

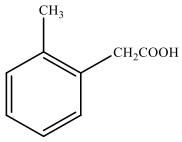

(b.) 

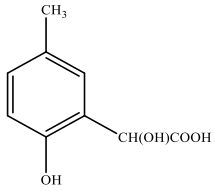

(c.) 

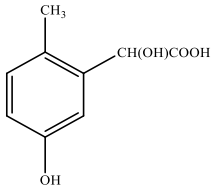

(d.) 


**(146.)** p-cresol reacts with chloroform in alkaline medium to give the compound A which adds hydrogen cyanide to form the compound B. The latter on acidic hydrolysis gives chiral carboxylic acid. The structure of carboxylic acid is

(a.) 


(b.) 


(c.) 

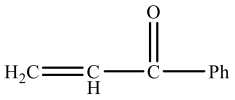
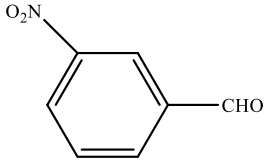
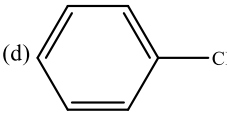

(d.) 


**(147.)** Following reaction is used to prepare alkane from sodium salt of carboxylic acid. The name of reaction is

$$RCOO^{-}Na^{+} \xrightarrow{NaOH\ \&CaOHeat} R-H+Na_2CO_3$$

(a.) Decarboxylation (b.) Kolbe electrolysis
(c.) HVZ reaction (d.) None of these

**(148.)** Match the Column I with Column II

| Column I | Column II |
|---|---|
| (a) $2CH_3CHO \xrightleftharpoons{\text{dil NaOH}}$ | (p) $PhCH_2OH + PhCOONa$ |
| (b) $PhCHO + \text{conc.NaOH} \xrightarrow{\Delta}$ | (q)  |
| (c) $PhCHO + PhCOCH_3 \xrightarrow[293]{OH^-}$ | (r)  |
| (d)  $\xrightarrow[273^{-283}\ K]{HNO_3/H_2SO_4}$ | (s) $CH_3CH=CHCHO$ |

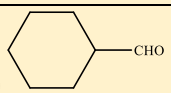
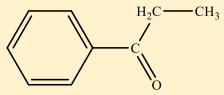
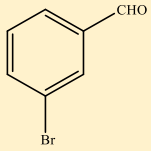
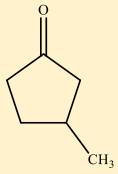
Codes

| | A | B | C | D |
|---|---|---|---|---|
| (a.) | r | q | p | s |
| (b.) | p | q | r | s |

(c.) s p q r

(d.) p s q r

**(149.)** Match the structure given in Column I with the name given in Column II

| **Column I** | **Column II** |
|---|---|
| **(structure)** | **(Name)** |
| (I)   | p) 2-methyl cyclohexanone |
| (II)   | q) 3-bromo benzaldehyde |
| (III)   | r) cyclohexane carbaldehyde |
| (IV)   | s) 1-phenylpropan-1- one |

Codes

I II III IV

(a.) p q r s (b.) r s q p

(c.) s r p q (d.) r s q p

**(150.)** In which of the following solvent, carboxylic acid is/are soluble?

(a.) benzene (b.) ether

(c.) chloroform (d.) All of these

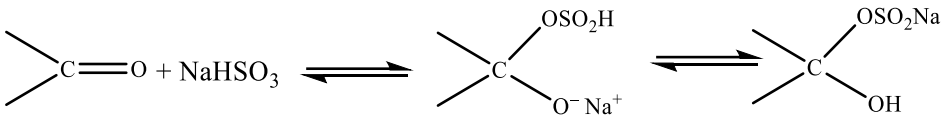
**(151) Assertion**: Carboxylic acids are reduced to alkanes on reaction with HI in presence of red phosphorus.

**Reason**: Melting point of carboxylic acid shows a regular pattern

(a.) Both A and R are correct and R is the correct explanation of A. (b.) Both A and R are correct but R is not correct explanation of A.

(c.) A is correct but R is incorrect. (d.) Both A and R are false.

**(152)** Consider the following reaction




Which of the following statement is incorrect for above reaction?

(a.) Aldehyde and ketone has its sterically hindered to give the required product. (b.) For aldehydes, the position of equilibrium lies to right hand side.

(c.) For ketones, the position of equilibrium lies to left hand side. (d.) The product formed is water soluble.

**(153)** Acyl chloride is hydrogenated over catalyst, palladium on barium sulphate. This reaction is called

(a.) Stephen reaction (b.) Rosenmund reduction

(c.) Birch reduction (d.) Wolff–Kishner reduction

**(154.)** **Assertion**: Strong oxidising agents oxidise toluene and its derivatives to benzoic acid.

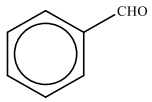
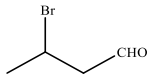
**Reason**: Chromyl chloride and chromic oxide stop the oxidation of toluene at aldehyde stage.

(a.) Both A and R are correct and R is the correct explanation of A.
(b.) Both A and R are correct but R is not correct explanation of A.
(c.) A is correct but R is incorrect.
(d.) Both A and R are false.

**(155.)** **Assertion**: Hydrogen bonding in carboxylic acid is stronger than alcohols.
**Reason**: Highly branched carboxylic acids are more acidic than unbranched acids

(a.) Both A and R are correct and R is the correct explanation of A.
(b.) Both A and R are correct but R is not correct explanation of A.
(c.) A is correct but R is incorrect.
(d.) Both A and R are false.

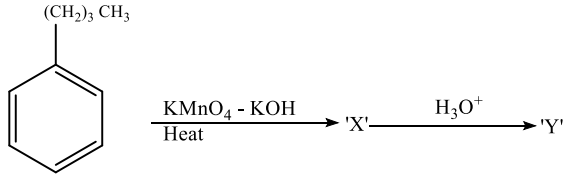
**(156.)** Which of the following is incorrect match?

(a.)  – Benzaldehyde
(b.) $\boldsymbol{CH_3CHO - Acetaldehyde}$
(c.)  $\alpha - OXO - \beta - bromopropane$
(d.) HCHO – formaldehyde

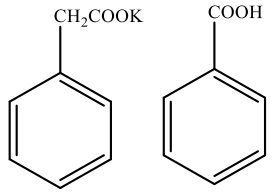
**(157.)** Which of the following statement is correct for Fehling's test?

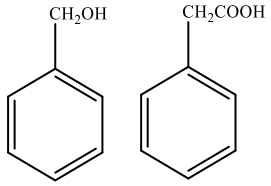
(a.) Fehling's solution is an aqueous copper sulphate solution.
(b.) Aldehydes on heating with Fehling's reagent give green precipitate.
(c.) Ketones does not give positive Fehling's test.
(d.) Aromatic aldehydes also reduces Fehling's solution.

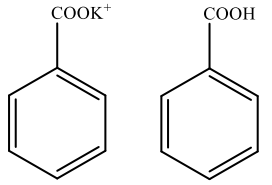
**(158.)** Consider the following reaction

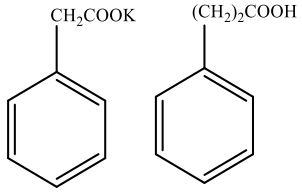



Here, 'X' and 'Y' respectively are:

(a.) 

(b.) 

(c.) 

(d.) 

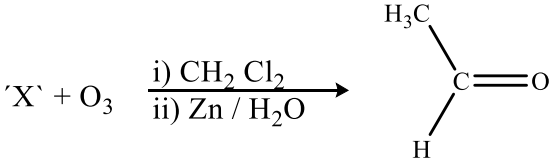

**(159.)** The carboxylic carbon is less electrophilic than carbonyl carbon because of

(a.) bond polarity
(b.) resonance
(c.) carbocation formation
(d.) carbanion formation

**(160.)** Aldehydes are more reactive towards nucleophilic addition reactions than ketones because of

(a.) inductive effect
(b.) steric effect
(c.) Both (a) and (b)
(d.) None of these

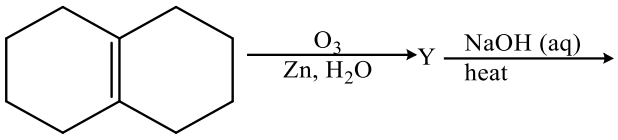
**(161.)** Consider the following reaction




The reactant 'X' is

(a.) But-2-ene
(b.) 2,3-dimethybut-2-ene
(c.) But-1-ene
(d.) 2-methylpropene

**(162.)** In the reaction given below, the total number of intermolecular aldol condensation products formed 'Y' is




(a.) 1 (b.) 2

(c.) 3 (d.) 4

**(163.)** The product formed by the reaction of an aldehyde with a primary amine **is**

(a.) Ketone (b.) Carboxylic acid

(c.) Aromatic acid (d.) Schiff base

**(164.)** Which of the following does not act as mild oxidising agent?

(a.) Tollen's reagent (b.) Fehling's reagent

(c.) Benedict's reagent (d.) Alk. $KMnO_4$

**(165.)** A compound A has molecular formula $C_2Cl_3OH$. It reduces Fehling's solution and on oxidation gives a monocarboxylic acid B. A can be obtained by the action of chlorine on ethyl alcohol. A is

(a.) chloroform (b.) monochloroacetic acid

(c.) chloral (d.) methyl chloride

**(166)** Benadryl, a well known antihistamine contains

(a) Primary amino group (b) Amide group

(c) Secondary amino group (d) Tertiary amino group

**(167)** The total number of electrons around the nitrogen atom in amines are

(a) 8 (b) 7 (c) 4 (d) 3

**(168)** Read the following statements and choose the correct option.

(i) Nitrogen atom in amines is *sp*3-hybridised.

(ii) The geometry of amines is pyramidal.

(iii) The angle C–N–C or C–N–H is slightly more than 109.5°.

(a) (i), (ii) and (iii) (b) (i) and (ii) (c) (i) and (iii) (d) (ii) and (iii)

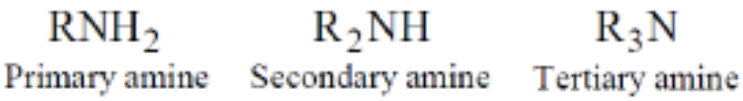
**(169)** A secondary amine is

(a) a compound with two carbon atoms and an –NH2 group.

(b) a compound containing two –NH2 groups.

(c) a compound in which hydrogens of NH3 have been replaced by two alkyl groups.

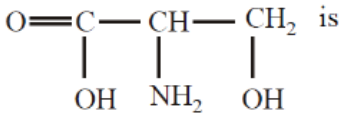
(d) a compound with an –NH2 group on carbon atom in number two position.




**(170)** The number of primary amines of formula $C_4H_{11}N$ is :

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

**(171)** The IUPAC name of the compound having formula,



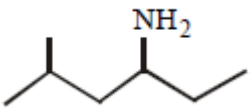

(a) 3-amino-hydroxy propine acid

(b) 2-amino-propan-3-oic acid

(c) amino hydroxy propanoic acid

(d) 2-amino-3-hydroxy propanoic acid

**(172)** What is the IUPAC name of the following compound



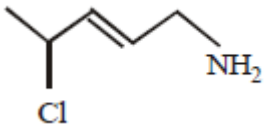

(a) 2-methyl-4-hexanamine

(b) 5-methyl-3-hexanamine
(c) 2-methyl-4-amino hexane
(d) 5-methyl-3-amino hexane

**(173.)** The IUPAC name of diethyl isopropyl amine is

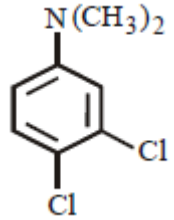
(a) N, N-diethylpropan-2-amine
(b) N, N-diethylpropan-1-amine
(c) N, N-diethylisopropylamine
(d) N, N-diethylaminopropane

**(174.)** IUPAC name of the following compound is




(a) 2-chloro pentanamine
(b) 4-chloro pentan-1-amine
(c) 4-chloro pent-2-en-1-amine
(d) 2-chloro pent-3-en-5-amine

**(175.)** Which of the following is the correct IUPAC name of the compound ?




(a) 1, 2-dichloro-4-(N, N-dimethyl) aniline
(b) Dimethyl – (3, 4-dichlorophenyl) amine
(c) 3, 4-dichloro - N, N-dimethyl aniline
nnnn(d) N, N-dimethylamino - 3, 4-dichlorobenzene

**(176.)** Which of the following reactions will not give a primary amine?

(a) $CH_3CONH_2 \xrightarrow{Br_2 / KOH}$

(b) $CH_3CN \xrightarrow{LiAlH_4}$

(c) $CH_3NC \xrightarrow{LiAlH_4}$

(d) $CH_3CONH_2 \xrightarrow{LiAlH_4}$

**(177.)** Propionamide on Hoffmann degradation gives –

(a) methyl amine
(b) ethyl amine
(c) propyl amine
(d) ethyl cyanide

**(178.)** Gabriel's phthalimide synthesis is used for the preparation of

(a) Primary aromatic amines
(b) Secondary amines
(c) Primary aliphatic amines
(d) Tertiary amines

**(179.)** The reduction of nitro compounds is most preferred in the presence of

(a) $Pd/H_2$ in ethanol
(b) Sn + HCl
(c) finely divided Ni
(d) iron scrap and HCl.

**(180.)** An alkyl or benzyl halide on reaction with an ethanolic solution of ammonia undergoes

(a) electrophilic substitution reaction
(b) nucleophilic substitution reaction.
(c) free radical mechanism.
(d) nucleophilic addition reaction.

**(181.)** In the ammonolysis of alkyl halides the halogen atom is replaced by an amino($–NH_2$) group which of the following represent the correct order of reactivity of halides with amines.

(a) RBr > RI > RCl
(b) RI > RCl > RBr
(c) RI > RBr > RCl
(d) RCl > RBr > RI

**(182.)** Which of the following will give primary amine only ?

(i) ammonia + propylchloride
(ii) potassium pthalimide + ethylchloride
(iii) potassium pthalimide + chlorobenzene

(a) (i) and (ii)
(b) (i) and (iii)
(c) (ii) and (iii)
(d) (i), (ii) and (iii)

**(183.)** A primary amine is formed by an amide on treatment with bromine and alkali. The primary amine has

(a) 1 carbon atom less than amide

(b) 1 carbon atom more than amide

(c) 1 hydrogen atom less than amide

(d) 1 hydrogen atom more than amide

**(184.) Assertion:** Aniline can not be prepared by Gabriel phthalamide reaction while phenyl methyl amine can.
**Reason:** Aniline is less basic than phenyl methyl aniline

(a) Assertion is true, Reason is true: Reason is a correct explanation for Assertion.

(b) Assertion is true, Reason is true: Reason is not a corret explanation for Assertion.

(c) Assertion is true, Reason is false.

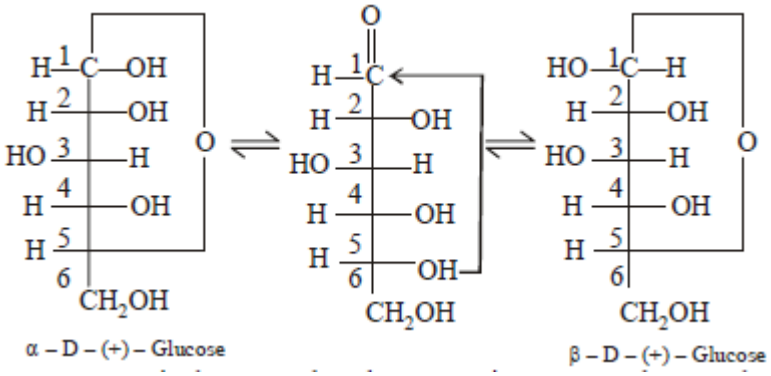
(d) Assertion is false, Reason is true

**(185.)** Amines have

(a) Garlic odour (b) Fishy odour

(c) Jasmine odour (d) Bitter almonds odour

**(186.)** Which of the following properties of glucose cannot be explained by its open chain structure?




(i) Glucose does not form hydrogen sulphite with NaHSO3

(ii) On oxidation with $HNO_3$ glucose gives saccharic acid.

(iii) Glucose is found to exist in two different crystalline forms which are named as a and b.

(a) (ii) only (b) (i) and (iii)

(c) (ii) and (iii) (d) (i) and (ii)

**(187.)** Which of the following statements is incorrect regarding glucose?

(a) It is an aldohexose.

(b) It is also known as dextrose

(c) It is monomer of cellulose.

(d) It is the least abundant organic compound on earth

**(188.)** Glucose gives silver mirror test with Tollen's reagent. It shows the presence of

(a) acidic group (b) alcoholic group

(c) ketonic group (d) aldehyde group

**(189.)** When glucose reacts with bromine water, the main product is

(a) gluconic acid (b) glyceraldehyde

(c) saccharic acid (d) acetic acid

**(190.)** Glucose does not react with

(a) $Br_2/H_2O$ (b) $H_2NOH$ (c) HI (d) $NaHSO_3$

**(191.)** Reduction of glucose by HI suggest that

(a) presence of OH groups

(b) presence of –CHO group

(c) cyclic structure of glucose

(d) six carbon atoms are arranged in straight chain

**(192.)** Which is the least stable form of glucose ?

(a) a-D-Glucose (b) b-D-Glucose

(c) Open chain structure (d) All are equally stable

**(193.)** The $\alpha$ -D glucose and $\beta$ -D glucose differ from each other due to difference in carbon atom with respect to its

(a) conformation (b) configuration
(c) number of OH groups (d) size of hemiacetal ring

**(194.)** Cellulose is a polymer of
(a) Glucose (b) Fructose (c) Ribose (d) Sucrose

**(195.)** Carbohydrates are stored in the body as
(a) sugars (b) starch (c) glucose (d) glycogen

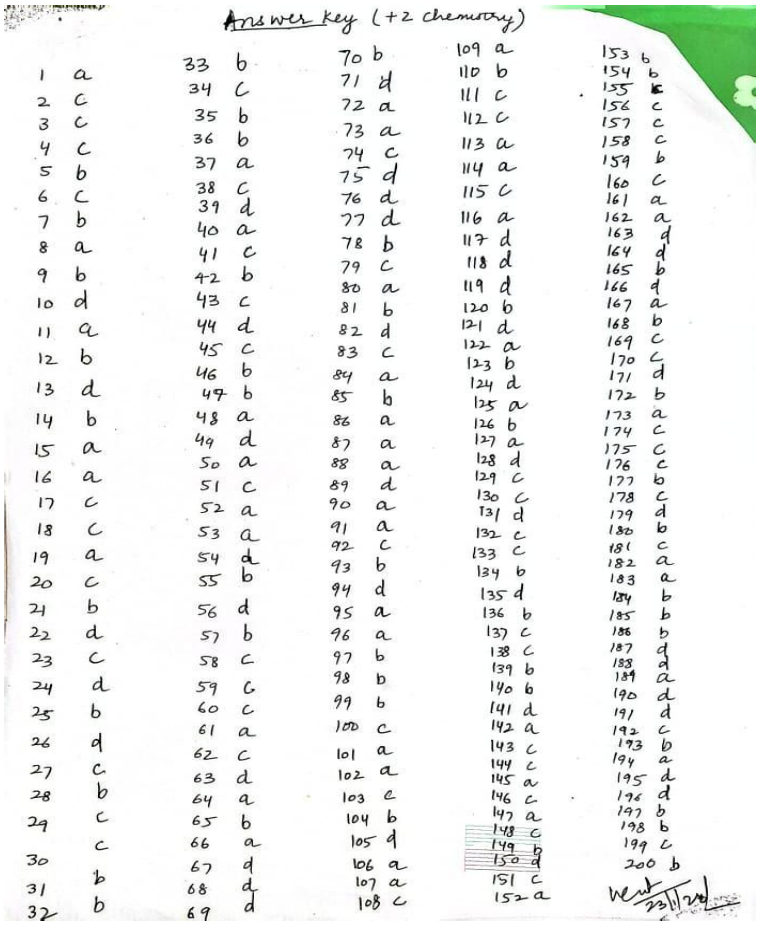
**(196.)** Lactose is made of
(a) a-D-glucose only (b) a-D-glucose and b-D-glucose
(c) a-D-galactose and b-D-glucose (d) b-D-galactose and b-D-glucose

**(197.)** Which of the following monosaccharides are present as five membered cyclic structure (furanose structure)?
(i) Ribose (ii) Glucose (iii) Fructose (iv) Galactose
(a) (i) and (ii) (b) (i) and (iii) (c) (iii) and (iv) (d) (ii) and (iii)

**(198.)** Invert sugar is
(a) chemically inactive form of sugar
(b) equimolecular mixture of glucose and fructose
(c) mixture of glucose and sucrose
(d) a variety of cane sugar

**(199.)** Chemically amylose is a _____ with 200-1000 -D-(+)-glucose units held by _____ glycosidic linkage
(a) long unbranched chain, C1- C6.
(b) branched chain, C1 - C4.
(c) long unbranched chain, C1- C4.
(d) branched chain, C1- C6.

**(200.)** Which of the following is incorrect about cellulose?
(a) It is a major constituent of cell wall of plant cells.
(b) It is a branched chain disaccharide
(c) It is composed of only b-D-glucose units.
(d) The glycosidic linkage between two units is found between C1 of one unit and C4 of next


Answer key (+2 chemistry)

1 a 2 c 3 c 4 c 5 b 6 c 7 b 8 a 9 b 10 d 11 a 12 b 13 d 14 b 15 a 16 a 17 c 18 c 19 a 20 c 21 b 22 d 23 c 24 d 25 b 26 d 27 c 28 b 29 c 30 c 31 b 32 b
33 b 34 c 35 b 36 b 37 a 38 c 39 d 40 a 41 c 42 b 43 c 44 d 45 c 46 b 47 b 48 a 49 d 50 a 51 c 52 a 53 a 54 d 55 b 56 d 57 b 58 c 59 c 60 c 61 a 62 c 63 d 64 a 65 b 66 a 67 d 68 d 69 d
70 b 71 d 72 a 73 a 74 c 75 d 76 d 77 d 78 b 79 c 80 a 81 b 82 d 83 c 84 a 85 b 86 a 87 a 88 a 89 d 90 a 91 a 92 c 93 b 94 d 95 a 96 a 97 b 98 b 99 b 100 c 101 a 102 a 103 e 104 b 105 d 106 a 107 a 108 c
109 a 110 b 111 c 112 c 113 a 114 a 115 c 116 a 117 d 118 d 119 d 120 b 121 d 122 a 123 b 124 d 125 a 126 b 127 a 128 d 129 c 130 c 131 d 132 c 133 c 134 b 135 d 136 b 137 c 138 c 139 b 140 b 141 d 142 a 143 c 144 c 145 a 146 c 147 a 148 c 149 b 150 d 151 c 152 a
153 b 154 b 155 b 156 c 157 c 158 c 159 b 160 c 161 a 162 a 163 d 164 d 165 b 166 d 167 a 168 b 169 c 170 c 171 d 172 b 173 a 174 c 175 c 176 c 177 b 178 c 179 d 180 b 181 c 182 a 183 a 184 b 185 b 186 b 187 d 188 d 189 a 190 d 191 d 192 c 193 b 194 a 195 d 196 d 197 b 198 b 199 c 200 b
Went 23/11/20