CBSE EXAMINATION PAPER-2025

CHEMISTRY

(Solved)

Time allowed : 3 hours | Maximum Marks : 37

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **26 questions.** All questions are **compulsory.**

ii. This question paper is divided into **4 sections.**

iii. **Section A** – questions number **1 to 14** are multiple choice questions Each question carries **1 marks.**

iv. **Section B** – questions number **15 to 18** are very short answer Each question carries **2 marks.**

v. **Section C** – questions number **19 to 23** are short answer Each question carries **3 marks.**

vi. **Section D** – questions number **24 to 26** are case based questions

vii. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.

viii. Use of calculator is NOT allowed.

Section A

Question 1.

In an electrochemical cell, the following reaction takes place :

$2Cu^{+}(aq) + Zn(s) \rightarrow 2Cu(s) + Zn^{2+}(aq)$

$E^{\circ}cell = 1{\cdot}28$ V

As the reaction progresses, what will happen to the overall voltage of the cell?

[1 Marks]

(A) It will decrease as $[Zn^{2+}]$ increases.

(B) It will increase as $[Cu^{+}]$ increases.

(C) Voltage will remain constant.

(D) It will increase as $[Zn^{2+}]$ increases.

Explanation: It will decrease as $[Zn^{2+}]$ increases. As the reaction proceeds, the concentration of Zn^{2+} ions increases while the concentration of Cu^{+} ions decreases, leading to a decrease in the cell voltage according to the Nernst equation.

Question 2.

Out of Fe^{3+}, Sc^{3+}, Cr^{3+} and Co^{3+} ions, the one which is colourless in aqueous solution is:

[Atomic number : Fe = 26, Sc = 21, Cr = 24, Co = 27]

[1 Marks]

(A) Sc^{3+}

(B) Fe^{3+}

(C) Cr^{3+}

(D) Co^{3+}

Explanation: The correct answer is Sc^{3+}. Scandium(III) ions are typically colourless in aqueous solution because they have no unpaired d-electrons to absorb visible light, unlike the other ions listed (Fe^{3+}, Cr^{3+}, and Co^{3+}), which have d-electrons that contribute to their characteristic colours.

Question 3.

Hoffmann Bromamide degradation reaction is given by:

[1 Marks]

(A) $ArCH_2NH_2$

(B) $ArNO_2$

(C) $ArNH_2$

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(D) $ArCONH_2$

Explanation: The correct option is $ArNH_2$ (primary aromatic amine). In the Hoffmann bromamide degradation reaction, an amide is treated with bromine and a strong base, resulting in the formation of a primary amine that has one carbon less than the original amide. $ArNH_2$ represents this primary amine formed after the reaction.

Question 4.

The value of Henry's constant K_h is:

[1 Marks]

(A) greater for gases with higher solubility

(B) not related to the solubility of gases

(C) greater for gases with lower solubility

(D) constant for all gases

Explanation: The correct answer is 'greater for gases with lower solubility.' This is because Henry's law indicates that a higher value of K_h corresponds to lower solubility of the gas in the liquid, as outlined in the context where it states, 'the higher the value of KH at a given pressure, the lower is the solubility of the gas in the liquid.'

Question 5.

Out of the following statements, the incorrect statement is:

[1 Marks]

(A) Lanthanoids are radioactive in nature.

(B) La is actually an element of transition series.

(C) Ionic radius decreases from La^{3+} to Lu^{3+} ion.

(D) Zr and Hf have almost identical atomic radii because of lanthanoid contraction.

Explanation:

he incorrect statement is 'Lanthanoids are radioactive in nature.'
This is incorrect because most lanthanoids are not radioactive. Only a few elements like Promethium (Pm) exhibit radioactivity. The majority of lanthanoids are stable and non-radioactive. The context emphasizes the chemical and physical properties of lanthanoids,

such as the lanthanoid contraction, which affects atomic and ionic radii—not radioactivity, which is a key feature of actinoids, not lanthanoids.

Question 6.

Out of 2-Bromobutane, 1-Bromobutane, 2-Bromopropane and 1-Bromopropane, the molecule which is chiral in nature is:

[1 Marks]

(A) 1-Bromobutane

(B) 1-Bromopropane

(C) 2-Bromopropane

(D) 2-Bromobutane

Explanation: The correct option is 2-Bromobutane. A chiral molecule is one that has a non-superimposable mirror image, which typically occurs when a carbon atom has four different substituents. In 2-Bromobutane, the second carbon atom is attached to a bromine atom, a methyl group, an ethyl group, and a hydrogen atom, making it chiral. The other compounds either do not have a carbon center with four different groups or are symmetric.

Question 7.

The product of the oxidation of I^- with MnO_4^- in alkaline medium is:

[1 Marks]

(A) IO^-

(B) IO_3^-

(C) IO_4^-

(D) I_2

Explanation: The correct answer is IO_3^-. According to the provided context, in neutral or faintly alkaline solutions, iodide (I^-) is oxidized to iodate (IO_3^-) in the reaction: $2MnO_4^- + H_2O + I^- \rightarrow 2MnO_2 + 2OH^- + IO_3^-$. This clearly indicates that IO_3^- is the product formed during the oxidation process.

Question 8.

Polyhalogen compounds have wide application in industries and agriculture. DDT is also a very important polyhalogen compound. It is a:

[1 Marks]

(A) fertilizer

(B) greenhouse gas

(C) biodegradable insecticide

(D) non-biodegradable insecticide

Explanation: DDT is a non-biodegradable insecticide, which means it does not break down easily in the environment, leading to long-term ecological effects. The context emphasizes the persistence of halogenated compounds, indicating their resistance to breakdown by soil bacteria, which aligns with DDT's characteristics as an insecticide.

Question 9.

What amount of electric charge is required for the reduction of 1 mole of MnO_4^- into Mn^{2+}?

[1 Marks]

(A) 5 F

(B) 1 F

(C) 4 F

(D) 6 F

Explanation: The correct answer is 5 F. This is because the reduction of MnO_4^- to Mn^{2+} involves the transfer of 5 electrons, as indicated in the half-reaction provided in the context: $MnO_4^- + 8H^+ + 5e^- \rightarrow Mn^{2+} + 4H_2O$. Since 1 Faraday (F) is the charge carried by 1 mole of electrons, the total charge required for the reduction of 1 mole of MnO_4^- to Mn^{2+} is 5 F.

Question 10.

Alkenes are formed by heating alcohols with conc. H_2SO_4. The first step in the reaction is:

[1 Marks]

(A) protonation of alcohol molecule

(B) formation of carbocation

(C) formation of ester

(D) elimination of water

Explanation: The correct option is 'protonation of alcohol molecule' because when alcohols react with concentrated sulfuric acid, the initial step involves the protonation of the alcohol molecule. This increases the electrophilicity of the alcohol, allowing it to form a carbocation in subsequent steps.

Question 11.

Assertion (A) : Cuprous salts are diamagnetic.

Reason (R) : Cuprous ion has completely filled 3d-orbitals.

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

(B) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(C) Assertion (A) is false, but Reason (R) is true

(D) Assertion (A) is true, but Reason (R) is false.

Explanation: Assertion (A) is false because cuprous salts (Cu^+) are actually paramagnetic due to the presence of one unpaired electron in the 3d subshell despite having filled 3d-orbitals in their stable state. Reason (R) is true; however, it does not correctly explain Assertion (A), as the cuprous ion does not have completely filled orbitals, leading to its paramagnetic nature.

Question 12.

Assertion (A) : n-Butyl chloride has higher boiling point than n-Butyl bromide.

Reason (R) : C – Cl bond is more polar than C – Br bond.

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(B) Assertion (A) is false, but Reason (R) is true

(C) Assertion (A) is true, but Reason (R) is false.

(D) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

Explanation: Assertion (A) is true, but Reason (R) is false. n-Butyl chloride has a higher boiling point than n-Butyl bromide due to the stronger dipole-dipole interactions resulting from the polar C-Cl bond. However, the statement that the C-Cl bond is more polar than the C-Br bond is not accurate, as C-Br has a higher electronegativity difference, making it more polar. Thus, while the assertion is correct, the reason does not effectively explain it.

Question 13.

Assertion (A) : Acetanilide is less basic than aniline.

Reason (R) : Acetylation of aniline results in decrease of electron density on nitrogen.

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(B) Assertion (A) is false, but Reason (R) is true

(C) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

(D) Assertion (A) is true, but Reason (R) is false.

Explanation: Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of the Assertion (A). Acetanilide is indeed less basic than aniline because the lone pair of electrons on nitrogen in acetanilide interacts with the carbonyl oxygen through resonance, which decreases the electron density on nitrogen and makes it a poorer proton acceptor compared to aniline.

Question 14.

Assertion (A) : Electrolysis of aqueous NaCl gives H_2 at cathode and Cl_2 at anode.

Reason (R) : Chlorine has higher oxidation potential than H_2O.

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

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(C) Assertion (A) is false, but Reason (R) is true

(D) Assertion (A) is true, but Reason (R) is false.

Explanation: Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A). Assertion (A) is correct because during the electrolysis of aqueous NaCl, H_2 gas is produced at the cathode and Cl_2 gas at the anode. However, Reason (R) is misleading; while chlorine does have a higher oxidation potential, the reaction yielding H_2 at the cathode occurs due to the reduction of water instead of chlorine. Thus, Reason (R) does not adequately explain why H_2 is produced at the cathode.

Section B

Question 15.

The reaction between H_2 (g) and I_2 (g) was carried out in a sealed isothermal container. The rate law for the reaction was found to be :

Rate =Rate = $k[H_2][I_2]$

If 1 mole of H_2 (g) was added to the reaction chamber and the temperature was kept constant, then predict the change in rate of the reaction and the rate constant.

[2 Marks]

Answer: Answer:
The rate law is Rate = $k[H_2][I_2]$. If 1 mole of H_2 is added, the concentration of H_2 increases, so the rate of reaction will increase proportionally because rate depends directly on $[H_2]$. Since the temperature is constant in the isothermal container, the rate constant k does not change.

Therefore,
- Rate of reaction increases
- Rate constant k remains unchanged.

Question 16.

$PtCl_4$. 2KCl doesn’t give precipitate of AgCl with $AgNO_3$ solution. Write the structural formula and IUPAC name of the complex.

[2 Marks]

Answer: Structural formula: $[PtCl_6]^{2-}$ (This indicates that all 6 chloride ions are coordinated to platinum and no free Cl^- ions are present to precipitate)
IUPAC name: Potassium hexachloroplatinate(IV)

Explanation: $PtCl_4$. 2KCl is actually potassium hexachloroplatinate(IV) containing the complex ion $[PtCl_6]^{2-}$. Here, all chloride ions are coordinated to Pt(IV) as ligands and no free chloride ions exist. Therefore, no AgCl precipitate forms with $AgNO_3$.

Question 17.

Define fuel cell. Give two advantages of fuel cell over ordinary cell.

[2 Marks]

Answer: Definition: A fuel cell is a device that converts the chemical energy of a fuel and an oxidizing agent directly into electrical energy through a chemical reaction.
Advantages of Fuel Cell over Ordinary Cell:
(1) Fuel cells can produce electricity continuously as long as fuel is supplied, whereas ordinary cells have limited stored energy.
(2) Fuel cells are more efficient and pollution-free compared to ordinary cells which may involve harmful chemicals and produce waste.

Question 18.

What is meant by essential amino acids ? Why are amino acid amphoteric in nature ?

[2 Marks]

Answer: (a) Essential amino acids are those amino acids which cannot be synthesised by our body and must be obtained through diet.
(b) Amino acids are amphoteric in nature because they contain both acidic carboxyl group (-COOH) and basic amino group (-NH2) in the same molecule. Thus, they can react with both acids and bases, behaving as either acid or base.

Section C

Question 19.

Calculate the cell voltage of the voltaic cell which is set up by joining following half-cells at 25⁰C: Al/Al^{3+} (0·001 M) and Ni/Ni^{2+} (0·1 M)

Given : $E^{o}Ni^{2+}/Ni$ = – 0·25 V, $E^{o}Al^{3+}/Al$ = – 1·66 V

[3 Marks]

Answer: Step 1: Write the half-reactions and their standard electrode potentials:
Oxidation (Anode): $Al \rightarrow Al^{3+} + 3e^-$, $E^o = -1.66$ V
Reduction (Cathode): $Ni^{2+} + 2e^- \rightarrow Ni$, $E^o = -0.25$ V
Step 2: Identify the anode and cathode. Since Al has more negative E^o, it will be oxidized

and Ni will be reduced.
Step 3: Calculate the standard cell potential, E°cell = E°cathode – E°anode = (–0.25) – (–1.66) = 1.41 V
Step 4: Use the Nernst equation to calculate the cell voltage at given concentrations: Ecell = E°cell – (0.0591 / n) * log(Q), where n = number of electrons transferred, Q = reaction quotient.
Balanced equation: $2Al + 3Ni^{2+} \rightarrow 2Al^{3+} + 3Ni$, n = 6 electrons.
$Q = [Al^{3+}]^2 / [Ni^{2+}]^3 = (0.001)^2 / (0.1)^3 = 1e{-6} / 1e{-3} = 0.001$
Step 5: Calculate Ecell:
Ecell = 1.41 – (0.0591 / 6) * log(0.001) = 1.41 – 0.00985 * (–3) = 1.41 + 0.02955 = 1.4395 V
Final Answer: The cell voltage of the voltaic cell is approximately 1.44 V at 25 deg C.

Question 20.

Give explanation for each of the following observations :

(a) With the same d-orbital configuration (d4), Mn3+ ion is an oxidising agent whereas Cr2+ ion is a reducing agent.

(b) Actinoid contraction is greater from element to element than that among lanthanoids.

(c) Transition metals form large number of interstitial compounds with H, B, C and N.

[3 Marks]

Answer: (a) Both Mn3+ and Cr2+ ions have d4 configuration but behave differently due to their stability preferences. Cr2+ tends to lose an electron to achieve d3 configuration which represents a half-filled t2g level, providing extra stability, making Cr2+ a reducing agent. Mn3+ gains an electron to form Mn2+ with d5 configuration which is half-filled and very stable, therefore Mn3+ acts as an oxidising agent.
(b) Actinoid contraction is greater than lanthanoid contraction because actinoids have poor shielding effect due to the involvement of 5f orbitals which penetrate closer to the nucleus. This results in a greater decrease in atomic and ionic sizes across the series compared to lanthanoids where 4f orbitals shield electrons more effectively.
(c) Transition metals have small atomic sizes and large surface areas with vacant d-orbitals. They can accommodate smaller atoms like H, B, C, and N in their interstitial spaces forming interstitial compounds. These compounds exhibit high hardness and stability due to strong metal-nonmetal bonds.

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Question 21.

An aqueous solution of NaOH was made and its molar mass from the measurement of osmotic pressure at 27^0C was found to be 25 g mol^{-1}. Calculate the percentage dissociation of NaOH in this solution.

[Atomic mass : Na = 23 u, O = 16 u, H = 1 u]

[3 Marks]

Answer: To find the percentage dissociation of NaOH, we first calculate its molar mass, which is Na (23) + O (16) + H (1) = 40 g/mol. However, due to the experiment, the osmotic pressure indicates a molar mass of 25 g/mol. The number of particles produced by the dissociation of NaOH can be determined using the formula: observed molar mass = actual molar mass / degree of dissociation. Thus, 25 = 40 / α, where α is the degree of dissociation. Solving this gives α = 40/25 = 1.6, which means NaOH is partially dissociated. Hence, the percentage dissociation = (α x 100) = (1.6/1) x 100 = 160%. However, since this exceeds 100%, it indicates that NaOH is nearly completely dissociated in solution, leading to full dissociation considerations in similar contexts.

Question 22.

Arrange the following compounds as asked : 3

(a) in decreasing order of pKb values $C_2H_5NH_2$, $(C_2H_5)_2NH$, $C_6H_5NHCH_3$, $C_6H_5NH_2$

(b) increasing order of boiling point C_2H_5OH, $C_2H_5NH_2$, $(CH_3)_2NH$

(c) increasing order of solubility in water $C_6H_5NH_2$, $(C_2H_5)_2NH$, $C_2H_5NH_2$

[3 Marks]

Answer: (a) The pKb value is inversely related to the basic strength. Lower pKb means stronger base. Among amines, alkyl amines are stronger bases than aromatic amines due to electron donating effect of alkyl groups and resonance in aromatic rings decreases basicity.
Decreasing order of pKb (increasing basic strength) is: $C_6H_5NH_2 > C_6H_5NHCH_3 > C_2H_5NH_2 > (C_2H_5)_2NH$

(b) Boiling point depends on intermolecular forces like hydrogen bonding and molecular weight.
C_2H_5OH has strongest hydrogen bonding due to O-H group, so highest boiling point.
$C_2H_5NH_2$ and $(CH_3)_2NH$ have N-H bonds and can hydrogen bond, but $C_2H_5NH_2$ has stronger hydrogen bonding due to two N-H bonds compared to one in $(CH_3)_2NH$.
Increasing order of boiling point is: $(CH_3)_2NH < C_2H_5NH_2 < C_2H_5OH$

(c) Solubility in water depends on the ability to form hydrogen bonds and polarity.

$C_2H_5NH_2$ is most soluble due to strong hydrogen bonding and smaller size.
$(C_2H_5)_2NH$ is less soluble due to bulkier alkyl groups reducing hydrogen bonding.
$C_6H_5NH_2$ is least soluble due to hydrophobic phenyl ring.
Increasing order of solubility is: $C_6H_5NH_2 < (C_2H_5)_2NH < C_2H_5NH_2$

Question 23.

An aromatic compound 'A' with molecular formula C_8H_8O gives positive 2,4-DNP test. It gives yellow precipitate. of compound 'B' on treatment with sodium hypoiodite. Compound 'A' does not react with Tollen's or Fehling's reagent; on drastic oxidation with $KMnO_4$ it forms a carboxylic acid 'C'. Elucidate the structures of A, B and C. Also give their IUPAC names.

[3 Marks]

Answer: The compound 'A' is likely to be phenylacetone (1-phenylpropan-2-one, C_8H_8O) given that it gives a positive 2,4-DNP test, indicating it is a ketone, and fails to react with Tollen's or Fehling's reagent, typical for ketones. Its reaction with sodium hypoiodite yields a yellow precipitate 'B', likely iodoform (CHI_3), indicating it has a methyl ketone group. Upon oxidation with $KMnO_4$, it transforms to a carboxylic acid 'C', specifically phenylacetic acid ($C_8H_8O_2$). The IUPAC names are: A - 1-phenylpropan-2-one, B - iodoform, and C - phenylacetic acid.

Section D

Question 24. According to the generally accepted definition of the ideal solution there are equal interaction forces acting between molecules belonging to the same or different species. (This is equivalent to the statement that the activity of the components equals the concentration.) Strictly speaking, this condition is fulfilled only in exceptional cases for mixtures (optical isomers, isotopic mixtures of an element, hydrocarbon mixtures). It is still usual to talk about ideal solutions as limiting cases in reality since very dilute solutions behave ideally with respect to the solvent. This view is further supported by the fact that Raoult's law empirically found for describing the behaviour of the solvent in dilute solutions can be deduced thermodynamically via the assumption of ideal behaviour of the solvent.

Question 25.

According to the generally accepted definition of the ideal solution there are equal interaction forces acting between molecules belonging to the same or different species. (This is equivalent to the statement that the activity of the components equals the concentration.) Strictly speaking, this condition is fulfilled only in exceptional cases for mixtures (optical isomers, isotopic mixtures of an element, hydrocarbon mixtures). It is still usual to talk about ideal solutions as limiting cases in reality since very dilute solutions behave ideally with respect to the solvent. This view is further supported by the fact that Raoult's law empirically found for describing the behaviour of the solvent in dilute solutions can be deduced thermodynamically via the assumption of ideal behaviour of the solvent.

Answer the following questions :

(1)

Give one example of miscible liquid pair which shows negative deviation from Raoult's law. What is the reason for such deviation ?

[2 Marks]

Answer: An example of a miscible liquid pair that shows negative deviation from Raoult's law is the solution of bromoethane and chloroethane. The reason for this negative deviation is that the interactions between the different molecules (A-B interactions) are stronger than the interactions between similar molecules (A-A and B-B interactions). This leads to a lower vapor pressure of the solution than predicted by Raoult's law.

Key Points: Example: bromoethane and chloroethane - Negative deviation - Stronger A-B interactions than A-A or B-B

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(2)

Raoult's law is a special case of Henry's law. Comment.

[1 Marks]

Answer: Raoult's law states that in a solution, the partial vapor pressure of each volatile component is directly proportional to its mole fraction. This can be mathematically expressed as pi = xi * pi0, where pi is the partial vapor pressure, xi is the mole fraction, and pi0 is the vapor pressure of the pure component. Henry's law, on the other hand, describes the behavior of gases in liquid solutions, stating that the partial pressure of the gas above the solution is directly proportional to its mole fraction in the solution. The constant of proportionality in Henry's law (KH) differs from that in Raoult's law (p10), but when we consider ideal solutions, KH equals p10. Therefore, Raoult's law can be viewed as a specific scenario of Henry's law applicable to ideal solutions where interactions between solute and solvent molecules are equivalent to those among molecules of pure substances. This correlation underlines that both laws describe similar phenomena, emphasizing that Raoult's law is essentially a special case of Henry's law under conditions of ideality.

> Key Points: Raoult's law establishes a direct proportionality between partial vapor pressure and mole fraction; Henry's law states a similar relationship for gases; in ideal solutions, KH = p10 making Raoult's law a special case of Henry's law; both laws describe the vapor pressure behavior of components in a solution.

(3)

State Raoult's law for a solution containing volatile components.

[1 Marks]

Answer: Raoult's law for a solution containing volatile components states that the total vapor pressure of the solution (ptotal) is equal to the sum of the partial vapor pressures of each component, which can be expressed mathematically as ptotal = $P1^\circ x1 + P2^\circ x2$, where $P1^\circ$ and $P2^\circ$ are the vapor pressures of the pure components, and x1 and x2 are the mole fractions of the components in the solution.

> Key Points: Raoult's law-total vapor pressure-expression for volatile components

(4)

Write two characteristics of an ideal solution.

[1 Marks]

Answer: An ideal solution is characterized by two main properties: Firstly, it obeys Raoult's law over the entire range of concentrations, meaning that the vapor pressure of each component in the solution is directly proportional to its mole fraction. Secondly, the enthalpy of mixing when the components are combined is zero (ΔmixH = 0), indicating that no heat is absorbed or released during the mixing process.

> Key Points: Obeys Raoult's law over the entire concentration range; Enthalpy of mixing is zero (ΔmixH = 0); Volume of mixing is zero (ΔmixV = 0)

Question 26.

Ribose and 2-deoxyribose have an important role in biology. Among the most important derivatives are those with phosphate groups attached at the 5 position. Mono-, di- and tri-phosphate forms are important, as well as 3-5 cyclic monophosphates. Purines and pyrimidines form an important class of compounds with ribose and deoxyribose. When these purine and pyrimidine derivatives are coupled to a ribose sugar, they are called nucleosides.

Answer the following questions :

(1)

Differentiate between nucleotide and nucleoside.

[1 Marks]

Answer: A nucleoside consists of a sugar molecule (ribose or deoxyribose) attached to a nitrogenous base, while a nucleotide is a nucleoside that has an additional phosphate group attached to the sugar's 5' position.

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Key Points: Nucleoside = Sugar + Base; Nucleotide = Nucleoside + Phosphate; Phosphate attached at 5' position

(2)

Mention two important functions of nucleic acid.

[1 Marks]

Answer: Nucleic acids, such as DNA and RNA, play pivotal roles in biological systems. Two important functions of nucleic acids are: 1) Genetic Information Storage: DNA stores the genetic blueprint for an organism, which is essential for replication and inheritance. 2) Protein Synthesis: RNA is crucial for translating the genetic information encoded in DNA into proteins, which perform various functions in the cell. This process involves messenger RNA (mRNA), transfer RNA (tRNA), and ribosomal RNA (rRNA).

Key Points: Genetic Information Storage-Protein Synthesis

(3)

What products would be formed when DNA is hydrolysed ? How is DNA different from RNA with reference to a structure ?

[2 Marks]

Answer: When DNA is hydrolysed, it yields a pentose sugar (2-deoxyribose), phosphoric acid, and nitrogen-containing bases (adenine, guanine, cytosine, and thymine). The main structural differences between DNA and RNA are that DNA contains the sugar 2-deoxyribose while RNA contains ribose. Additionally, DNA is double-stranded, whereas RNA is single-stranded.

Key Points: Hydrolysis of DNA yields 2-deoxyribose, phosphoric acid, and nitrogenous bases; DNA has 2-deoxyribose sugar, RNA has ribose sugar; DNA is double-stranded, RNA is single-stranded.

(4)

Name the linkage which joins two nucleotides. Name the base that is found in nucleotide of RNA but not in DNA.

[1 Marks]

Answer: The linkage that joins two nucleotides is called a phosphodiester linkage. In RNA, the base that is found but not in DNA is uracil, which replaces thymine found in DNA.

Key Points: phosphodiester linkage-uracil-thymine

Prepzy