NEST Chemistry Sample Paper – 10

Duration: 45 Minutes **Maximum Marks: 60**

Instructions

- This paper contains **20 Multiple Choice Questions (single correct answer)**, modelled on the Chemistry section of **NEST 2026**.
- Each correct answer carries **+3 marks**. There is a deduction of -1 **mark** for each incorrect answer; **no marks** are deducted for an unattempted question.
- Every question has exactly **four options**, of which only **one** is correct. Choose carefully.
- Personal calculators, log tables, mobile phones, and other electronic gadgets are strictly prohibited in the examination hall.
- A simple on-screen (virtual) calculator is provided in the computer-based test interface and may be used; blank sheets for rough work are supplied at the exam centre.

Q1. A sample of drinking water contains dissolved calcium ions at a concentration of 20 ppm by mass. Assuming the density of the solution is 1 g mL^{-1}, the mass of calcium present in 500 mL of this water is

(A) 40 mg

(B) 20 mg

(C) 10 mg

(D) 5 mg

Q2. According to the $(n + l)$ rule, orbitals are filled in order of increasing $(n+l)$, and for equal $(n+l)$ the orbital with lower n is filled first. Among $4s$, $3d$, $4p$ and $5s$, the orbital that is filled *last* is

(A) $4s$

(B) $3d$

(C) $4p$

(D) $5s$

Q3. The successive ionization energies (in kJ mol^{-1}) of an element X are 738, 1451, 7733 and 10540. The large jump occurs between the second and third ionization energies. The element X most likely belongs to

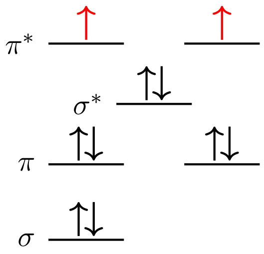
(A) Group 1 (alkali metals)

(B) Group 2 (alkaline earth metals)

(C) Group 13

(D) Group 14

Q4. Using molecular orbital theory, consider the diatomic species B_2, C_2, N_2 and O_2. The partial molecular-orbital energy-level scheme for the valence shell is shown below. Which of these species is paramagnetic with exactly two unpaired electrons?



(A) O_2

(B) N_2

(C) C_2

(D) B_2

Q5. Given the reactions $C(s) + O_2(g) \rightarrow CO_2(g),\ \Delta H_1 = -393\ \text{kJ mol}^{-1}$ and $CO(g) + \frac{1}{2}O_2(g) \rightarrow CO_2(g),\ \Delta H_2 = -283\ \text{kJ mol}^{-1}$, the enthalpy change for $C(s) + \frac{1}{2}O_2(g) \rightarrow CO(g)$ is

(A) $-676\ \text{kJ mol}^{-1}$

(B) $+110\ \text{kJ mol}^{-1}$

(C) -110 kJ mol^{-1}

(D) -393 kJ mol^{-1}

Q6. An aqueous solution of which of the following salts will be *basic* in nature?

(A) NH_4Cl

(B) $NaCl$

(C) $(NH_4)_2SO_4$

(D) CH_3COONa

Q7. The standard reduction potentials are $E^\circ(F_2/F^-) = +2.87$ V, $E^\circ(Cl_2/Cl^-) = +1.36$ V, $E^\circ(Br_2/Br^-) = +1.09$ V and $E^\circ(I_2/I^-) = +0.54$ V. The strongest oxidizing agent among the halogens is

(A) Cl_2

(B) F_2

(C) Br_2

(D) I_2

Q8. A gas mixture contains 4 g of helium ($M = 4$) and 14 g of nitrogen ($M = 28$) in a container at a total pressure of 3 atm. The partial pressure of helium in the mixture is

(A) 2 atm

(B) 1 atm

(C) 1.5 atm

(D) 0.5 atm

Q9. At the same temperature, four solutions are prepared, each in 1 L of water. Which solution is isotonic with (has the same osmotic pressure as) a 0.1 M glucose solution? (Assume complete dissociation of electrolytes.)

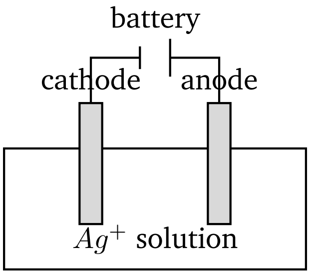
(A) 0.1 M $NaCl$

(B) 0.05 M $CaCl_2$

(C) 0.1 M urea

(D) 0.1 M K_2SO_4

Q10. In the electrolytic cell shown, molten or aqueous $AgNO_3$ is electrolysed and 1.08 g of silver ($M = 108$ g mol^{-1}) is deposited at the cathode using a steady current of 1.0 A. Taking the Faraday constant $F = 96500$ C mol^{-1}, the time of electrolysis is closest to



(A) 193 s

(B) 482.5 s

(C) 1930 s

(D) 965 s

Q11. For the elementary reaction $2NO(g) + O_2(g) \rightarrow 2NO_2(g)$, which of the following statements about its rate law and molecularity is correct?

(A) Rate $= k[NO][O_2]$; molecularity $= 2$

(B) Rate $= k[NO]^2[O_2]$; molecularity $= 3$

(C) Rate $= k[NO]^2[O_2]^2$; molecularity $= 4$

(D) Rate $= k[NO_2]^2$; molecularity $= 2$

Q12. Among the M^{2+}/M standard electrode potentials of the first transition (3d) series, one element shows an unexpectedly positive (less negative) value because of its high sublimation and ionization enthalpies, making it the only 3d metal that does not liberate hydrogen from dilute acids. That element is

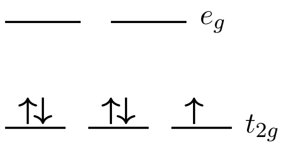
(A) Zn

(B) Mn

(C) Cu

(D) Fe

Q13. The complex ion $[Fe(CN)_6]^{3-}$ has Fe in the $+3$ state ($Fe^{3+} = 3d^5$), and CN^- is a strong-field ligand producing the octahedral crystal-field splitting shown. The number of unpaired electrons and the spin-only magnetic moment $\mu = \sqrt{n(n+2)}$ are



(A) $n = 5$, $\mu = 5.92$ BM

(B) $n = 1$, $\mu = 1.73$ BM

(C) $n = 3$, $\mu = 3.87$ BM

(D) $n = 0$, $\mu = 0$ BM

Q14. The molecule 2,3-dibromobutane, $CH_3 - CHBr - CHBr - CH_3$, has two stereocentres. Taking into account the existence of a meso form, the total number of distinct stereoisomers of this compound is

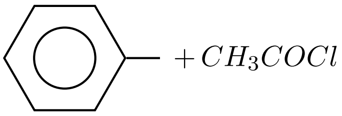
(A) 4

(B) 2

(C) 1

(D) 3

Q15. Benzene reacts with acetyl chloride (CH_3COCl) in the presence of anhydrous $AlCl_3$ (Friedel–Crafts acylation), as represented below. The major organic product is



benzene

(A) acetophenone ($C_6H_5COCH_3$)

(B) toluene ($C_6H_5CH_3$)

(C) benzoic acid (C_6H_5COOH)

(D) chlorobenzene (C_6H_5Cl)

Q16. In the Finkelstein reaction, an alkyl chloride or bromide is converted to an alkyl iodide by treatment with NaI in dry acetone, the driving force being the precipitation of $NaCl$ or $NaBr$. The product of the reaction of CH_3CH_2Br with NaI in dry acetone is

(A) CH_3CH_2F

(B) CH_3CH_2Cl

(C) CH_3CH_2I

(D) CH_3CH_2OH

Q17. When phenol is treated with an excess of bromine water at room temperature, the major product formed is a white precipitate. This product is

(A) o-bromophenol only

(B) p-bromophenol only

(C) 3-bromophenol

(D) $2, 4, 6$-tribromophenol

Q18. Acetic acid (CH_3COOH) is heated with ethanol (C_2H_5OH) in the presence of a few drops of concentrated H_2SO_4 (Fischer esterification). The major organic product is

(A) ethyl acetate ($CH_3COOC_2H_5$)

(B) acetaldehyde (CH_3CHO)

(C) diethyl ether ($C_2H_5OC_2H_5$)

(D) sodium acetate (CH_3COONa)

Q19. A reagent that distinguishes aniline ($C_6H_5NH_2$) from ethylamine ($C_2H_5NH_2$) is cold HNO_2 ($\mathrm{NaNO_2}$ + dilute HCl, 0–$5\,°$C) followed by an alkaline solution of β-naphthol. Aniline gives a characteristic result that ethylamine does not. That characteristic result is

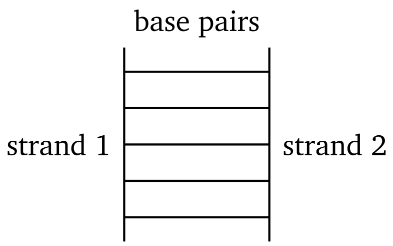
(A) brisk effervescence of N_2 gas

(B) a bright orange-red azo dye

(C) a blue colouration

(D) no observable reaction

Q20. In a double-stranded DNA molecule (shown schematically as a ladder of base pairs), Chargaff's rule states that the amount of adenine equals that of thymine and the amount of guanine equals that of cytosine. If a sample of double-stranded DNA contains 30% adenine (A) bases, then the percentage of guanine (G) bases is



(A) 30%

(B) 40%

(C) 20%

(D) 70%

Detailed Solutions

Q1.

Solution

Concept — ppm and mass of solute: A concentration of x ppm by mass means x grams of solute per 10^6 g of solution, equivalently x mg per kg of solution.

Step 1 — Mass of solution: With density $1\ \mathrm{g\,mL^{-1}}$, 500 mL of water has mass 500 g $= 0.5$ kg.

Step 2 — Mass of calcium: 20 ppm $=$ 20 mg per kg of solution. So mass $=$ $20 \times 0.5 = 10$ mg.

Why other options are wrong:

- (A) 40 mg uses 2 kg of solution.
- (B) 20 mg uses 1 kg (i.e. 1 L), not 500 mL.
- (D) 5 mg uses only 250 mL.

Final Answer: 10 mg $\Rightarrow \boxed{\text{C}}$

Answer: (C) **Go Back to Q1**

Q2.

Solution

Concept — $(n + l)$ (Madelung) rule: Orbitals fill in order of increasing $(n + l)$; for a tie, the orbital with the smaller n fills first.

Step 1 — Compute $(n+l)$: $4s$: $4+0 = 4$; $3d$: $3+2 = 5$; $4p$: $4+1 = 5$; $5s$: $5+0 = 5$.

Step 2 — Order the fills: $4s$ $(= 4)$ first. Among the three with $(n + l) = 5$, lower n fills first: $3d$ $(n = 3)$, then $4p$ $(n = 4)$, then $5s$ $(n = 5)$. So the last to be filled is $5s$.

Why other options are wrong:

- (A) $4s$ has the lowest $(n + l)$ and fills first.
- (B) $3d$ fills before $4p$ and $5s$.
- (C) $4p$ fills before $5s$.

Final Answer: $5s$ is filled last $\Rightarrow \boxed{\text{D}}$

Answer: (D) **Go Back to Q2**

Q3.

Solution

Concept — Successive ionization energies: A large jump in successive ionization energy appears once all valence electrons are removed and the next electron must come from a noble-gas (inner) core.

Step 1 — Locate the jump: The jump is between IE_2 (1451) and IE_3 (7733). So two electrons are removed easily, and the third is far harder.

Step 2 — Identify the group: Two valence electrons means a Group 2 (alkaline earth) element; after losing both, the stable noble-gas core resists the third removal.

Why other options are wrong:

- (A) Group 1 would jump after IE_1 (one valence electron).
- (C) Group 13 would jump after IE_3.
- (D) Group 14 would jump after IE_4.

Final Answer: Group 2 $\Rightarrow \boxed{\text{B}}$

$\boxed{\textbf{Answer: (B)}}$ **Go Back to Q3**

Q4.

Solution

Concept — MOT and paramagnetism: Fill valence electrons into molecular orbitals; a species is paramagnetic if it has unpaired electrons. For O_2, the two highest electrons occupy the two degenerate π^* orbitals singly (Hund's rule).

Step 1 — Count valence electrons: O_2 has 12 valence electrons. Filling order gives the final two electrons in the two π^*_{2p} orbitals, one in each.

Step 2 — Unpaired count: Those two π^* electrons are unpaired, so O_2 is paramagnetic with exactly two unpaired electrons (the red arrows in the diagram).

Why other options are wrong:

- (B) N_2 has all electrons paired (diamagnetic).
- (C) C_2 is diamagnetic (its two π levels are each doubly filled).
- (D) B_2 is paramagnetic but with electrons in π (bonding), and it is not the standard "two unpaired in π^*" case targeted here; O_2 is the textbook paramagnetic diatomic.

Final Answer: $O_2 \Rightarrow \boxed{\text{A}}$

$\boxed{\text{Answer: (A)}}$ Go Back to Q4

Q5.

Solution

Concept — Hess's-law cycle: The target reaction is obtained by subtracting reaction 2 from reaction 1, so $\Delta H_{\text{target}} = \Delta H_1 - \Delta H_2$.

Step 1 — Combine equations: $C + O_2 \to CO_2$ (ΔH_1) minus $CO + \frac{1}{2}O_2 \to CO_2$ (ΔH_2) gives $C + \frac{1}{2}O_2 \to CO$.

Step 2 — Compute: $\Delta H = \Delta H_1 - \Delta H_2 = (-393) - (-283) = -393 + 283 = -110$ kJ mol^{-1}.

Why other options are wrong:

- (A) -676 adds the two enthalpies instead of subtracting.
- (B) $+110$ has the sign reversed.
- (D) -393 is ΔH_1 alone.

Final Answer: $\Delta H = -110\ \text{kJ mol}^{-1} \Rightarrow \boxed{\text{C}}$

$\boxed{\text{Answer: (C)}}$ Go Back to Q5

Q6.

Solution

Concept — Salt hydrolysis: A salt of a strong base and a weak acid hydrolyses to give a *basic* solution; a salt of a strong acid and weak base gives an acidic solution; a strong-acid/strong-base salt is neutral.

Step 1 — Classify CH_3COONa: It comes from $NaOH$ (strong base) and CH_3COOH (weak acid). The acetate ion hydrolyses: $CH_3COO^- + H_2O \rightleftharpoons CH_3COOH + OH^-$, producing OH^-.

Step 2 — Conclusion: Excess OH^- makes the solution basic $(pH > 7)$.

Why other options are wrong:

- (A) NH_4Cl (weak base + strong acid) is acidic.
- (B) $NaCl$ (strong acid + strong base) is neutral.
- (C) $(NH_4)_2SO_4$ (weak base + strong acid) is acidic.

Final Answer: $CH_3COONa \Rightarrow \boxed{\text{D}}$

$\boxed{\text{Answer: (D)}}$ Go Back to Q6

Q7.

Solution

Concept — Oxidizing strength and $E°$: The species with the most positive standard reduction potential is the most easily reduced, hence the strongest oxidizing agent.

Step 1 — Compare potentials: $E°(F_2/F^-) = +2.87$ V is the highest of the four.

Step 2 — Conclusion: F_2 has the greatest tendency to be reduced, so it is the strongest oxidant.

Why other options are wrong:

- (A) Cl_2 ($+1.36$ V) is a weaker oxidant than F_2.
- (C) Br_2 ($+1.09$ V) is weaker still.
- (D) I_2 ($+0.54$ V) is the weakest oxidant here.

Final Answer: $F_2 \Rightarrow \boxed{\text{B}}$

$\boxed{\text{Answer: (B)}}$ Go Back to Q7

Q8.

Solution

Concept — Mole fraction and partial pressure: The partial pressure of a gas equals its mole fraction times the total pressure, $p_i = x_i\, P_{\text{total}}$.

Step 1 — Moles: He: $\frac{4}{4} = 1$ mol; N_2: $\frac{14}{28} = 0.5$ mol. Total $= 1.5$ mol.

Step 2 — Mole fraction and partial pressure: $x_{\text{He}} = \frac{1}{1.5} = \frac{2}{3}$, so $p_{\text{He}} = \frac{2}{3} \times 3 = 2$ atm.

Why other options are wrong:

- (B) 1 atm and (D) 0.5 atm use the wrong mole fraction.
- (C) 1.5 atm assumes equal moles of the two gases.

Final Answer: $p_{\text{He}} = 2$ atm $\Rightarrow \boxed{\text{A}}$

$\boxed{\text{Answer: (A)}}$ Go Back to Q8

Q9.

Solution

Concept — Isotonic solutions: Two solutions are isotonic if they have equal osmotic pressure, i.e. equal iC (van't Hoff factor times molar concentration of particles). Glucose ($i = 1$) at 0.1 M gives an effective particle concentration of 0.1 M.

Step 1 — Effective particle concentration of options: $NaCl$: $i = 2$, $0.1 \times 2 = 0.2$; $CaCl_2$: $i = 3$, $0.05 \times 3 = 0.15$; urea: $i = 1$, $0.1 \times 1 = 0.1$; K_2SO_4: $i = 3$, $0.1 \times 3 = 0.3$.

Step 2 — Match to 0.1: Only 0.1 M urea gives 0.1 M particles, matching glucose.

Why other options are wrong:

- (A) $NaCl$ gives 0.2 M particles (hypertonic).
- (B) $CaCl_2$ gives 0.15 M particles.
- (D) K_2SO_4 gives 0.3 M particles.

Final Answer: 0.1 M urea $\Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q9

Q10.

Solution

Concept — Faraday's laws / $Q = It$: Charge needed $Q = \dfrac{\text{moles deposited} \times n \times F}{1}$, and time $t = \dfrac{Q}{I}$. For $Ag^+ + e^- \rightarrow Ag$, $n = 1$.

Step 1 — Moles and charge: Moles of Ag $= \dfrac{1.08}{108} = 0.01$ mol. Charge $Q = 0.01 \times 1 \times 96500 = 965$ C.

Step 2 — Time: $t = \dfrac{Q}{I} = \dfrac{965}{1.0} = 965$ s.

Why other options are wrong:

- (A) 193 s uses 0.002 mol.
- (B) 482.5 s halves the charge.
- (C) 1930 s wrongly takes $n = 2$.

Final Answer: $t = 965$ s $\Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q10

Q11.

Solution

Concept — Elementary reactions: For an *elementary* reaction, the rate law follows directly from the stoichiometric coefficients, and the molecularity equals the total number of reactant species in that single step.

Step 1 — Write the rate law: The step $2NO + O_2 \to 2NO_2$ involves two NO and one O_2, so Rate $= k[NO]^2[O_2]$.

Step 2 — Molecularity: Total reactant molecules $= 2 + 1 = 3$, so molecularity $= 3$ (termolecular).

Why other options are wrong:

- (A) omits the second power on $[NO]$ and undercounts molecularity.
- (C) uses too high a power on $[O_2]$.
- (D) writes the rate in terms of the product NO_2, which is incorrect.

Final Answer: Rate $= k[NO]^2[O_2]$; molecularity $= 3 \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q11

Q12.

Solution

Concept — E° anomaly in the 3d series: Copper has a positive $E^\circ(Cu^{2+}/Cu) = +0.34$ V because the high sum of its sublimation and ionization enthalpies is not balanced by its hydration enthalpy. Hence copper alone among the common 3d metals does not displace hydrogen from dilute acids.

Step 1 — Identify the property: A positive M^{2+}/M potential means the metal is not readily oxidized by H^+, so no H_2 is liberated from dilute acid.

Step 2 — Match to copper: Cu fits this description in the 3d series.

Why other options are wrong:

- (A) Zn has a strongly negative E° (-0.76 V); it does react with dilute acid.
- (B) Mn has a negative E° and reacts with dilute acid.
- (D) Fe has a negative E° and reacts with dilute acid.

Final Answer: $Cu \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q12

Q13.

Solution

Concept — Crystal-field splitting and magnetic moment: For an octahedral strong-field d^5 ion, electrons pair in the lower t_{2g} set before occupying e_g, giving a low-spin configuration $t_{2g}^5 e_g^0$ with one unpaired electron.

Step 1 — Configuration: Fe^{3+} is $3d^5$. With strong-field CN^-, all five electrons go into t_{2g} as t_{2g}^5 (two pairs + one single electron), e_g^0. So $n = 1$ (the diagram shows two paired levels and one single electron).

Step 2 — Magnetic moment: $\mu = \sqrt{1(1+2)} = \sqrt{3} = 1.73$ BM.

Why other options are wrong:

- (A) $n = 5$, 5.92 BM is the high-spin (weak-field) case, not for CN^-.
- (C) $n = 3$, 3.87 BM does not correspond to low-spin d^5.
- (D) $n = 0$ would require an even electron count.

Final Answer: $n = 1$, $\mu = 1.73$ BM $\Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q13

Q14.

Solution

Concept — Stereoisomers with a meso form: A molecule with two identical stereocentres can show fewer than 2^n stereoisomers because of an internal mirror plane (meso compound).

Step 1 — Count naively: Two stereocentres suggest $2^2 = 4$ arrangements.

Step 2 — Apply symmetry: 2,3-dibromobutane has two equivalent ends. The (R, S) and (S, R) forms are the same achiral meso compound, while (R, R) and (S, S) are a pair of enantiomers. So the distinct stereoisomers are: one pair of enantiomers + one meso $= 3$.

Why other options are wrong:

- (A) 4 ignores the meso reduction.
- (B) 2 counts only the enantiomeric pair.
- (C) 1 ignores stereoisomerism entirely.

Final Answer: 3 distinct stereoisomers $\Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q14

Q15.

Solution

Concept — Friedel–Crafts acylation: An acyl chloride with a Lewis acid ($AlCl_3$) generates an acylium ion (CH_3CO^+) that substitutes onto the benzene ring, giving an aryl ketone.

Step 1 — Electrophile: $CH_3COCl + AlCl_3 \rightarrow CH_3CO^+ + AlCl_4^-$.

Step 2 — Substitution: The acylium ion attacks benzene, and after loss of H^+ the product is $C_6H_5COCH_3$ (acetophenone).

Why other options are wrong:

- (B) Toluene results from Friedel–Crafts *alkylation* with CH_3Cl, not acylation.
- (C) Benzoic acid requires oxidation, not acylation.
- (D) Chlorobenzene comes from halogenation, not from acetyl chloride.

Final Answer: Acetophenone ($C_6H_5COCH_3$) $\Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q15

Q16.

Solution

Concept — Finkelstein reaction: $R{-}X + NaI \xrightarrow{\text{dry acetone}} R{-}I + NaX\downarrow$. NaI is soluble in acetone whereas $NaCl/NaBr$ are not, so their precipitation drives the equilibrium to the iodide.

Step 1 — Identify substitution: The bromide in CH_3CH_2Br is replaced by iodide via S_N2.

Step 2 — Product: CH_3CH_2I (with $NaBr$ precipitating out).

Why other options are wrong:

- (A) Formation of the fluoride is the Swarts reaction (uses AgF/SbF_3), not Finkelstein.
- (B) CH_3CH_2Cl would be the reverse, not favoured.
- (D) No water/OH^- is involved, so no alcohol forms.

Final Answer: $CH_3CH_2I \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q16

Q17.

Solution

Concept — Bromination of phenol: The $-OH$ group is a strong activating, o, p-directing group. With bromine water (excess), polysubstitution occurs at all available o and p positions.

Step 1 — Activation: Phenol is so reactive that no catalyst is needed; bromine water alone substitutes.

Step 2 — Product: The $2, 4, 6$-positions are all brominated, giving the white precipitate $2, 4, 6$-tribromophenol.

Why other options are wrong:

- (A) and (B) Mono-bromination needs controlled, non-aqueous, low-temperature conditions, not excess bromine water.
- (C) 3-bromophenol is a meta product, not formed since $-OH$ is o, p-directing.

Final Answer: $2, 4, 6$-tribromophenol $\Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q17

Q18.

Solution

Concept — Fischer esterification: A carboxylic acid reacts with an alcohol under acid catalysis to form an ester and water: $RCOOH + R'OH \rightleftharpoons RCOOR' + H_2O$.

Step 1 — Identify partners: Acetic acid (CH_3COOH) is the acid; ethanol (C_2H_5OH) is the alcohol; conc. H_2SO_4 is the catalyst (and dehydrating agent).

Step 2 — Product: $CH_3COOH + C_2H_5OH \rightleftharpoons CH_3COOC_2H_5 + H_2O$, i.e. ethyl acetate.

Why other options are wrong:

- (B) Acetaldehyde is an oxidation/reduction product, not an esterification product.
- (C) Diethyl ether forms from two alcohol molecules, not from an acid + alcohol.
- (D) Sodium acetate requires a base ($NaOH$), not acid catalysis.

Final Answer: Ethyl acetate ($CH_3COOC_2H_5$) $\Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q18

Q19.

Solution

Concept — Azo-dye (diazonium) test: Aromatic primary amines form a stable diazonium salt with cold HNO_2; coupling with β-naphthol gives a brightly coloured azo dye. Aliphatic amines form unstable diazonium salts that decompose, releasing N_2, so no dye forms.

Step 1 — Aniline: $C_6H_5NH_2 \xrightarrow{HNO_2, 0\text{–}5°C} C_6H_5N_2^+$ (stable), which couples with β-naphthol to give an orange-red azo dye.

Step 2 — Ethylamine: Its diazonium salt is unstable, decomposing to give N_2 and an alcohol; no coloured dye is produced.

Why other options are wrong:

- (A) Effervescence of N_2 is what the aliphatic amine (ethylamine) shows, not aniline.
- (C) A blue colour is not the azo-coupling result.
- (D) "No reaction" describes neither; aniline clearly gives the dye.

Final Answer: A bright orange-red azo dye $\Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q19

Q20.

Solution

Concept — Chargaff's rule: In double-stranded DNA, $\%A = \%T$ and $\%G = \%C$, and all four base percentages sum to 100%.

Step 1 — Use $\%A = \%T$: If $\%A = 30\%$, then $\%T = 30\%$. Together $A + T = 60\%$.

Step 2 — Find $\%G$: The remaining 40% is shared equally between G and C (since $\%G = \%C$), so $\%G = \frac{40}{2} = 20\%$.

Why other options are wrong:

- (A) 30% confuses G with A.
- (B) 40% is the combined $G + C$, not G alone.
- (D) 70% is $100 - 30$, ignoring the $G = C$ split.

Final Answer: $\%G = 20\% \Rightarrow \boxed{\text{C}}$

$\boxed{\text{Answer: (C)}}$ Go Back to Q20

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	C	2	D	3	B	4	A	5	C
6	D	7	B	8	A	9	C	10	D
11	B	12	C	13	B	14	D	15	A
16	C	17	D	18	A	19	B	20	C