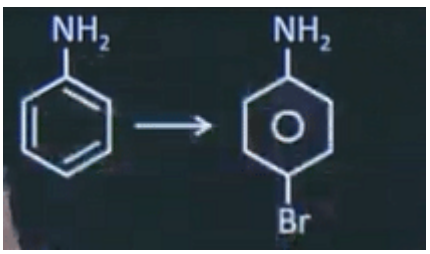
# JEE Main 24 January 2025 Shift 2

## Chemistry Question Paper with Answer Key

| Q.No. | Questions | Answers |
|---|---|---|
| 1 | Consider the following reaction<br>$S(s) + 3/2O_2(g) \rightarrow SO_3(g) + 2x$ KJ<br>$SO_2(g) + 1/2O_2(g) \rightarrow SO_3(g) + y$ KJ<br>Calculate $\Delta H_r$ for the following reaction (KJ)<br>$S(s) + O_2 \rightarrow SO_2(g)$ | y - 2x |
| 2 | The conditions and consequences that favour the $t^3_{2g}e^1_g$ configuration in a metal complex are | Weak field ligand; High spin complex |
| 3 | When ethane-1, 2-diammine is progressively added to aqueous solution of Nickel (II) chloride the sequence of colour change observed will be: | Green→Pale Blue→Blue→Violet |
| 4 | Statement 1: The first ionisation energy of Pb is greater than that of Sn.<br>Statement 2: The first ionisation energy of Ge is greater than that of Si. | Statement 1 is correct but Statement 2 is incorrect. |
| 5 |  | $Ac_2O$, $Fe/Br_2$, $H_2O/H^+$ |

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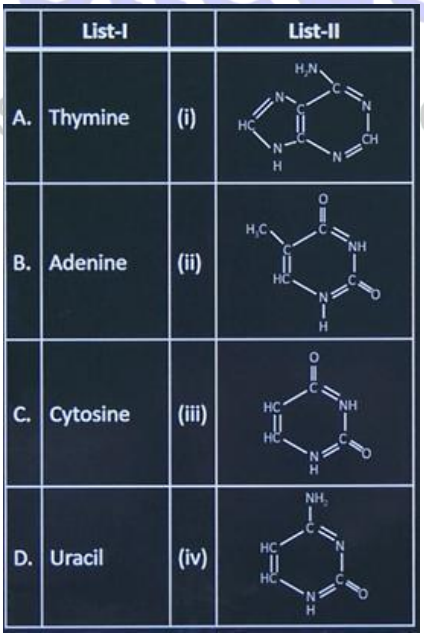
| | Above conversion can be done by using which reagents among the following. | |
| 6 | Match the column:<br>A. $SC^{3+}$ - (P) 2.84<br>B. $Ti^{2+}$ - (Q) 0<br>C. $V^{2+}$ - (R) 5.92<br>D. $Mn^{2+}$ - (S) 3.87 | A→(Q), B → (P), C→ (S), D → (R) |
| 7 | In a compound contains 54.2% carbon, 9.2% of hydrogen and the rest are oxygen. What is molecular formula of compound, if molecular mass is 132 g/mol? | $C_6H_{12}O_3$ |
| 8 | Match the following nitrogenous bases present in List-l with their structures present in List-II.<br>  <br> | A-(ii), B-(i), C-(iv), D-(iii) |

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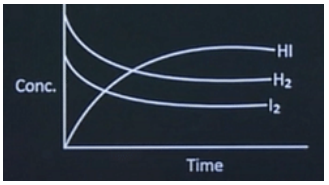
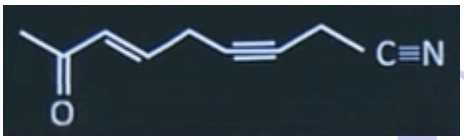
| 9 | Consider the following gaseous reaction<br>$H_2(g) + I_2(g) \rightarrow 2HI$<br>The above reaction is started with 'a' moles of $H_2$ and 'b' moles of $I_2$ in a closed container at a certain temperature T(K) till the equilibrium is established. Which one of the following plots correctly describes the progress of reaction? |  |
| 10 | In the given compound no. of Sp and $Sp^2$ hybridised carbon are<br>  | 3 and 3 |
| 11 | How many stereoisomers are possible for 5-Phenylpent-4-en-2-ol? | 4 |
| 12 | A hydrocarbon X which has molar mass 80g contains 90% carbon. Find degree of unsaturation in X. | 3 |
| 13 | The successive ionisation energy (IE) of an element 'X' is given<br>  <br>Data given in KJ/mol.<br>Find out the group number of element x. | Group-2 |

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| 14 | Consider the following statements :<br><br>Statement-l: Oxygen-oxygen bond in $O_3$ is greater than $O_2$.<br><br>Statement-II: O-O bond order in $O_3$ is 1.5 and O-O bond order in $O_2$ is 2. | Both Statement 1 and Statement 2 are correct |
| 15 | In Carius method of estimation of halogen, 0.25 g of an organic compound gave 0.16 g of AgBr. What is the percentage of bromine in the compound (Given molar mass of Ag = 108, Br = 80) | 27% |
| 16 | Let $k_1$, $k_2$ and $k_3$ be the rate constant of reaction and k = √k1k3/k2. Then find activation energy of overall reaction. (Given: $Ea_1$ = 10 kJ/mol, $Ea_2$ = 30 kJ/mol, $Ea_3$ = 60 kJ/mol) | 20 |