**RUBRICS: HSSC 1st ANNUAL EXAMINATION 2022**

**SUBJECT: CHEMISTRY HSSC-I (Hard Area) Final: 18-06-2022 Time 1:30PM**

| **Q.# /Part #** | **Criteria**  | **Level 1 (Marks)** | **Level 2(Marks)** | **Level 3 (Marks)** | **Level 4 (Marks)** | **Level 5 (Marks)** |
| --- | --- | --- | --- | --- | --- | --- |
| $$2(i)$$ | Why actual yield is less than theoretical yield? | Any three correct arguments (3) | Any two correct arguments (2) | Any one correct argument (1) | Wrong (0) |  |
| $$2(ii)$$ | Calculation of enthalpy of formation of acetic acid from given data | Correct calculation (3) | Partially correct (2) | Some correct mathematical steps (1) | Wrong (0) |  |
| $$2(iii)$$ | Production of X-ray with reference to Moseley’s Law | Correct description (3) | Partially correct description (2) | Some relevant information (1) | Wrong (0) |  |
| $$2(iv)$$ | Calculation of He+1  | Correct calculation (1.5) | Partially correct calculation (1) | Some correct mathematical steps (0.5) | Wrong (0) |  |
| Calculation of Li2+ | Correct calculation (1.5) | Partially correct calculation (1) | Some correct mathematical steps (0.5) | Wrong (0) |  |
| $$2(v)$$ | Defects of VBT | Correctly writing any three defects (3) | Correctly writing any two defects (2) | Correctly writing any one defect (1) | Wrong (0) |  |
| $$2(vi)$$ | Causes of deviation of gasses from ideality  | Two correct causes (3) | Partially correct response (2) | Some relevant information (1) | Wrong (0) |  |
| $$2(vii)$$ | Differences between sigma and Pi bond | Any three correct differences (3) | Any two correct differences (2) | Any one correct difference (1) | Wrong (0) |  |
| $$2(viii)$$ | Definition/Description of molar heat of vaporization and fusion  | Correct definition/ description of each (2) | Correct definition/ description of any one (1) | Some relevant information (0.5) | Wrong (0) |  |
| Writing reason that ΔHv > ΔHf | Writing correct reason (1) | Partially correct response (0.5) | Wrong (0) |  |  |
| $2(ix$) | Forces responsible for regular change in boiling point of hydrides of group IV and the reason | Correct identification of forces along with the reason of the regular change (3) | Partially correct response (2) | Some relevant information (1) | Wrong (0) |  |
| $2(x$) | Description of Lattice energy with example (formation) | Correct description along with correct example (1.5) | Partially correct response (1) | Some relevant information (0.5) | Wrong (0) |  |
| Description of Lattice energy with example (decomposition) | Correct description along with correct example (1.5) | Partially correct response (1) | Some relevant information (0.5) | Wrong (0) |  |
| $$2(xi)$$ | Explanation of nature of the given salts with the help of chemical equations | Three correct explanations with correct chemical equations (3) | Two correct explanations with correct chemical equations (2) | One correct explanation with correct chemical equation (1) | Some relevant information (0.5) | Wrong (0) |
| $$2\left(xii\right)$$ | Calculation of Kc | Correct calculation (3) | Partially correct calculation (2) | Some correct mathematical steps (1) | Wrong (0) |  |
| 2(xiii) | Derivation of Relative lowering of vapour pressure  | Correct derivation (3) | Partially correct derivation (2) | Some correct mathematical steps (1) | Wrong (0) |  |
| $$2(xiv)$$ | Calculation of freezing point of solution | Correct calculation (3) | Partially correct calculation (2) | Some correct mathematical steps (1) | Wrong (0) |  |
| $$2(xv)$$ | Differentiation between $ Δ$E and ΔH | Correct differentiation (2) | Partially correct differentiation (1) | Some relevant information (0.5) | Wrong (0) |  |
| Condition for equivalence of $Δ$E and ΔH | Describing correct condition (1) | Partially correct response (0.5) | Wrong (0) |  |  |
| 2(xvi) | Construction and working of S.H.E. | Correct construction and working of S.H.E. (3) | Partially correct response (2) | Some relevant information (1) | Wrong (0) |  |
| 2(xvii) | Description of Galvanizing | Correct description (1) | Partially correct response (0.5) | Wrong (0) |  |  |
| Reason of calling galvanizing as sacrificial corrosion  | Correct reason (2) | Partially correct reason (1) | Some relevant information (0.5) | Wrong (0) |  |
| 2(xviii) | Writing thermochemical equations | Three correct equations (3) | Two correct equations (2) | One correct equation (1) | Wrong (0) |  |
| 2(xix) | Description of Bond energy  | Correct description (1) | Partially correct description (0.5) | Wrong (0) |  |  |
| Writing Reason that bond energy of H-F > H-I | Writing correct reason (2) | Partially correct response (1) | Some relevant information (0.5) | Wrong (0) |  |
| 2(xx) | Enlisting two factors affecting LDF | Enlisting two correct factors (2) | Enlisting one correct factor (1) | Some relevant information (0.5) | Wrong (0) |  |
| Writing reason that LDF is stronger in Rn than He in noble gases  | Writing correct reason (1) | Partially correct response (0.5) | Wrong (0) |  |  |
| 3 (a) | Effect of catalyst on rate of reaction | Correct explanation (2) | Partially correct (1) | Some relevant information (0.5) | Wrong (0) |  |
| Explaining the action of catalyst with example and graph | Correct explanation with example and graph (3) | Partially correct response (2) | Some relevant information (1) | Wrong (0) |  |
| Types of catalysis  | Correctly describing the two types (2) | Correctly describing any one type (1) | Some relevant information (0.5) | Wrong (0) |  |
| $3(b$) | Derivation of vander wall’s equation for volume | Correct derivation (2) | Partially correct derivation (1) | Some relevant information (0.5) | Wrong (0) |  |
| Derivation of vander wall’s equation for pressure | Correct derivation (2) | Partially correct derivation (1) | Some relevant information (0.5) | Wrong (0) |  |
| Derivation of units a and b | Correct derivation of both (2) | Correct derivation of any one (1) | Some relevant information (0.5) | Wrong (0) |  |
| $4$ (a) | Balancing of redox equation by Oxidation number method | Correct balancing (3) | Partially correct balancing (2) | Some relevant information (1) | Wrong (0) |  |
| Balancing of Redox equation by Ion electron method | Correct balancing (3) | Partially correct balancing (2) | Some relevant information (1) | Wrong (0) |  |
| 4 (b) | Explanation of Buffer | Correct explanation (2) | Partially correct explanation (1) | Some relevant information (0.5) | Wrong (0) |  |
| Types and composition of buffer | Mentioning the two types correctly along with their composition (2)  | Partially correct response (1) | Some relevant information (0.5) | Wrong (0) |  |
| Buffer action with example | Correct description of Buffer action along with correct example (3) | Partially correct response (2) | Some relevant information (1) | Wrong (0) |  |
| 5 (a) | Explanation of the quantitative aspects of freezing point depression | Correct explanation of quantitative aspects including graph (4) | Partially correct explanation with graph (3) | Partially correct explanation without graph (2) | Some relevant information (1) | Wrong (0) |
| Proving the required condition | Correct derivation (3) | Partially correct derivation (2) | Some correct mathematical steps (1) | Wrong (0) |  |
| 5 (b) | Calculation of amount of H2 from given data | Correct calculation of H2 (4) | Partially correct calculation of H2 (3) | Calculation upto mass of Al from data (2) | Any relevant step related to calculation of H2 (1) | Wrong (0) |
| Calculation of percentage yield of H2 | Correct formula and calculation (2) | Partially correct (1) | Wrong (0) |  |  |