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

**SUBJECT: CHEMISTRY HSSC-I (Local) 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)** | | **Level 6 (Marks)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Calculation of volume of CHBr3 | Correct calculation of volume (3) | Partially correct calculation (2) | Some correct mathematical steps (1) | Wrong (0) | |  | |  | |
|  | Defects of Bohr’s Model | Any three correct defects (3) | Any two correct defects (2) | Any one correct defect (1) | Some relevant information (0.5) | | Wrong (0) | |  | |
|  | Determination of polarity on the basis of dipole moment | Correct explanation with the help of CO2 and Cis-1, 2-dichloro ethene (3) | Partially correct explanation with CO2 and Cis-1,2-dichloro ethene (2) | Some relevant information (1) | Wrong (0) | |  | |  | |
|  | Shape and bond angle of *H2S* molecule | Correct response (1) | Partially correct response (0.5) | Wrong (0) |  | |  | |  | |
| Shape and bond angle of *SnCl2* molecule | Correct response (1) | Partially correct response (0.5) | Wrong (0) |  | |  | |  | |
| Shape and bond angle of *PCl3* molecule | Correct response (1) | Partially correct response (0.5) | Wrong (0) |  | |  | |  | |
|  | Explanation of Azimuthal quantum number | Correct explanation (2) | Partially correct explanation (1) | Some relevant information (0.5) | Wrong (0) | |  | |  | |
| Role of azimuthal quantum number in determination of number of electron in a subshell | Correct explanation of role (1) | Partially correct (0.5) | Wrong (0) |  | |  | |  | |
|  | Prove that K. E T | Correct derivation (3) | Partially correct (2) | Some correct mathematical steps (1) | Wrong (0) | |  | |  | |
|  | Determination of molar mass from general gas equation | Correct determination of molar mass (1.5) | Partially correct determination of molar mass (1) | Some relevant information (0.5) | Wrong (0) | |  | |  | |
| Determination of density from general gas equation | Correct determination of density (1.5) | Partially correct determination of density (1) | Some relevant information (0.5) | Wrong (0) | |  | |  | |
|  | Scientific Reasoning | Correct explanation with correct reason (3) | Partially correct explanation (2) | Some relevant information (1) | Wrong (0) | |  | |  | |
| ) | Differentiation between isomorphism and polymorphism | Correct differentiation with examples (3) | Partially correct response (2) | Some relevant information (1) | Wrong (0) | |  | |  | |
| ) | Description of electron sea theory along with its role in explaining the properties of metal | Correct description along with explanations of properties (3) | Partially correct response (2) | Some relevant information (1) | Wrong (0) | |  | |  | |
|  | Prediction of direction of reaction | Correct calculation and correct prediction (3) | Correct calculation with wrong prediction (2) | Partially correct response (1) | Wrong (0) | |  | |  | |
|  | Calculation of pH | Correct calculation (3) | Partially correct calculation (2) | Some correct mathematical steps (1) | Wrong (0) | |  | |  | |
| 2(xiii) | Explanation of nature of the given salts with the help of chemical equations | Three correct explanations with chemical equation(3) | Two correct explanations with chemical equation (2) | One correct explanation with chemical equation(1) | Some relevant information (0.5) | | Wrong (0) | |  | |
|  | Mechanism of reaction and prediction of reaction intermediate | Correct mechanism involving two correct steps with correct prediction of intermediate (3) | Partially correct response (2) | Some relevant information (1) | Wrong (0) | |  | |  | |
|  | Description/explanation of diffusion | Correct description/explanation (1) | Partially correct description/explanation (0.5) | Wrong (0) |  | |  | |  | |
| Statement of Graham’s law | Correct statement of Graham’s law (1) | Partially correct (0.5) | Wrong (0) |  | |  | |  | |
| Mathematical expression | Correct mathematical expression (1) | Partially correct (0.5) | Wrong (0) |  | |  | |  | |
| 2(xvi) | Calculation of molality | Correct calculation of molality (3) | Partially correct (2) | Some correct mathematical steps (1) | Wrong (0) | |  | |  | |
| 2(xvii) | Definition/statement of system, surrounding and boundary | Correct description of all three (2) | Correct description of any two (1.5) | Correct description of any one (1) | Some relevant information (0.5) | | Wrong (0) | |  | |
| Example | Correct example (1) | Partially correct example (0.5) | Wrong (0) |  | |  | |  | |
| 2(xviii) | Prediction of feasibility of reaction | Correct calculation and prediction (3) | Correct calculation without prediction (2) | Partially correct response (1) | Some correct mathematical steps (0.5) | | Wrong (0) | |  | |
| 2(xix) | Description of vacume distillation with reason | Correct explanation with reason (3) | Partially correct response (2) | Some relevant information(1) | Wrong (0) | |  | |  | |
| 2(xx) | Application of *n + l* rule to pick low energy orbital | All three correct calculation with indication of lower energy orbital (3) | Any two correct calculation with indication of lower energy orbital (2) | Any one correct calculation with indication of lower energy orbital (1) | Wrong (0) | |  | |  | |
|  | Calculation of amount of CO from given data | Correct calculation of CO (4) | Partially correct calculation of CO (3) | Calculation of CO from any one reactant (2) | Any relevant step related to calculation of CO (1) | | Wrong (0) | |  | |
| Calculation of percentage yield of CO | Correct formula and calculation (2) | Partially correct (1) | Wrong (0) |  | |  | |  | |
| ) | Construction of lead storage battery | Correct description of construction (3) | Partially correct response (2) | Some relevant information (1) | Wrong answer (0) | |  | |  | |
| Reactions during charging and discharging | All four correct reactions of charging and discharging (4) | Any three correct reactions of charging and discharging (3) | Any two correct reactions of charging and discharging (2) | Any one correct reaction of charging and discharging (1) | | Wrong answer (0) | |  | |
| (a) | Statement | Correct statement (1.5) | Partially correct information (1) | Some relevant information (0.5) | Wrong answer (0) | |  | |  | |
| Explanation of C2 H2 | Correct explanation (1.5) | Partially correct explanation (1) | Some relevant information (0.5) | Wrong answer (0) | |  | |  | |
| Explanation of BF3 | Correct explanation (1.5) | Partially correct explanation (1) | Some relevant information (0.5) | Wrong answer (0) | |  | |  | |
| Explanation of CH4 | Correct explanation (1.5) | Partially correct explanation (1) | Some relevant information (0.5) | Wrong answer (0) | |  | |  | |
| 4 (b) | Statement of Le-Chatelier’s principle | Correct statement (1) | Partially correct response (0.5) | Wrong (0) |  | |  | |  | |
| Discussing the effect of increase in pressure | Correct response (1.5) | Partially correct response (1) | Some relevant information (0.5) | Wrong (0) | |  | |  | |
| Discussing the effect of increase in concentration of SO2 | Correct response (1.5) | Partially correct response (1) | Some relevant information (0.5) | Wrong (0) | |  | |  | |
| Discussing the effect of increase in temperature | Correct response (1.5) | Partially correct response (1) | Some relevant information (0.5) | Wrong (0) | |  | |  | |
| Discussing the effect of increase in NO2 catalyst | Correct response (1.5) | Partially correct response (1) | Some relevant information (0.5) | Wrong (0) | |  | |  | |
| 5 (a) | Drawing Born Haber cycle for MgO | Correct and complete Born Haber cycle with six steps (6) | Partially complete Born Haber cycle with five correct steps (5) | Partially complete Born Haber cycle with four correct steps (4) | Partially complete Born Haber cycle with three correct steps (3) | Partially complete Born Haber cycle with two correct steps (2) | | Partially complete Born Haber cycle with one correct step (1) | | Wrong (0) | |
| 5 (b) | Reason of increase in boiling point | Correct description of reason (2) | Partially correct description of reason (1) | Wrong (0) |  | |  | |  | |
| Explanation of the quantitative aspect of elevation of boiling point | Correct explanation of quantitative aspects (3) | Partially correct explanation (2) | Some relevant information (1) | Wrong (0) | |  | |  | |
| Proving the required condition | Correct derivation (2) | Partially correct derivation (1) | Some correct mathematical steps (0.5) | Wrong (0) | |  | |  | |