

**Strictly Confidential: (For Internal and Restricted use only)**

**Senior Secondary School Term–II Examination, 2022**

**Marking Scheme: CHEMISTRY (Subject Code: 043)**

**[ Paper Code: 56/1/3]**

**General Instructions: -**

1. You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
2. **“Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, Evaluation done and several other aspects. Its’ leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in News Paper/Website etc may invite action under IPC.”**
3. Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one’s own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. **However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and marks be awarded to them. In class-X, while evaluating two competency-based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, marks should be awarded.**
4. The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
5. Evaluators will mark( ✓ ) wherever answer is correct. For wrong answer ‘X’ be marked. Evaluators will not put right kind of mark while evaluating which gives an impression that answer is correct and no marks are awarded. **This is most common mistake which evaluators are committing.**
6. If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totalled up and written in the left-hand margin and encircled. This may be followed strictly.
7. If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
8. If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out.
9. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
10. A full scale of marks 0-35 has to be used. Please do not hesitate to award full marks if the answer deserves it.
11. Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 30 answer books per day in main subjects and 35 answer books per day in other subjects (Details are given in Spot Guidelines). This is in view of the reduced syllabus and number of questions in question paper.
12. Ensure that you do not make the following common types of errors committed by the Examiner in the past:-
  - Leaving answer or part thereof unassessed in an answer book.

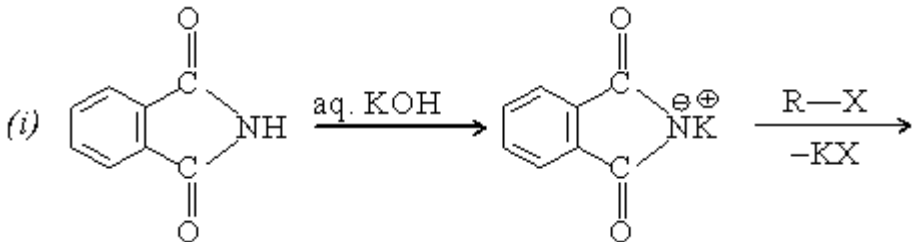
- Giving more marks for an answer than assigned to it.
  - Wrong totaling of marks awarded on a reply.
  - Wrong transfer of marks from the inside pages of the answer book to the title page.
  - Wrong question wise totaling on the title page.
  - Wrong totaling of marks of the two columns on the title page.
  - Wrong grand total.
  - Marks in words and figures not tallying.
  - Wrong transfer of marks from the answer book to online award list.
  - Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.)
  - Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
13. While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0) Marks.
  14. Any unassessed portion, non-carrying over of marks to the title page, or totalling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
  15. The Examiners should acquaint themselves with the guidelines given in the Guidelines for spot Evaluation before starting the actual evaluation.
  16. Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totalled and written in figures and words.
  17. The Board permits candidates to obtain photocopy of the Answer Book on request in an RTI application and also separately as a part of the re-evaluation process on payment of the processing charges.

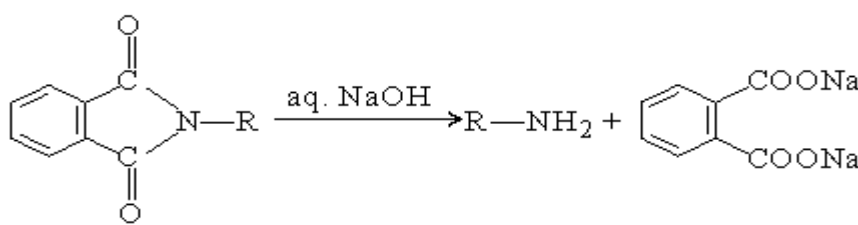
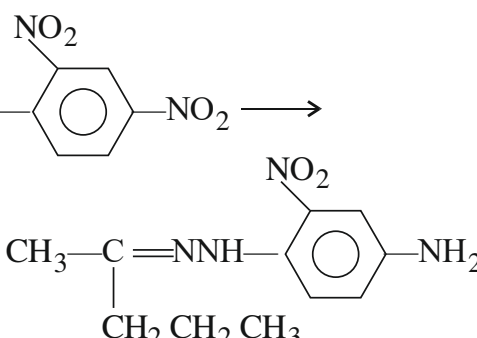
# MARKING SCHEME

Senior Secondary School Examination TERM–II, 2022



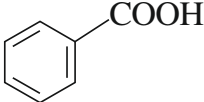
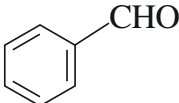
## CHEMISTRY (Subject Code–043)

[ Paper Code: 56/1/3]

Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks												
	<b>SECTION—A</b>													
1.	(i) $(C_2H_5)_2NH > (C_2H_5)_3N > C_2H_5NH_2$ (ii) $C_6H_5NH_2 < (C_2H_5)_2NH < C_2H_5NH_2$ (iii) $C_6H_5NH_2 > NH_3 > C_2H_5NH_2$ <div style="text-align: right;">(Any two)</div>	1×2												
2.	(i) $X$ = Strong electrolyte, $Y$ = Weak electrolyte (ii) Curve $X$ intercepts at $Y$ -axis to obtain $\Lambda_m^\circ$ whereas curve $Y$ runs parallel to $Y$ -axis and no $\Lambda_m^0$ is obtained.	½+½  ½+½												
3.	The reactions which occur through a sequence of elementary reactions to give the products. Yes order of complex reaction can be determined but molecularity has no meaning for complex reaction.	1  ½ ½												
	<b>SECTION—B</b>													
4.	(a) <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th><th><i>Physisorption</i></th><th><i>Chemisorption</i></th></tr> </thead> <tbody> <tr> <td>1.</td><td>Arise from weak van der Waals forces</td><td>Strong chemical bonds</td></tr> <tr> <td>2.</td><td>Reversible</td><td>Irreversible</td></tr> <tr> <td>3.</td><td>Multimolecular layers</td><td>Unimolecular layer</td></tr> </tbody> </table> <div style="text-align: right;">(or any other correct difference)</div>		<i>Physisorption</i>	<i>Chemisorption</i>	1.	Arise from weak van der Waals forces	Strong chemical bonds	2.	Reversible	Irreversible	3.	Multimolecular layers	Unimolecular layer	1×3
	<i>Physisorption</i>	<i>Chemisorption</i>												
1.	Arise from weak van der Waals forces	Strong chemical bonds												
2.	Reversible	Irreversible												
3.	Multimolecular layers	Unimolecular layer												
4.	(b) <b>OR</b> (i) The colloids in which the particles of dispersed phase have more affinity towards dispersion medium. Example: Gum. (ii) The colloids obtained by dissolving macromolecules in suitable solvents. Example: Starch. (iii) The settling of colloidal particles / conversion of colloidal sol into precipitate. Example: Electrophoresis. <div style="text-align: right;">(Any other suitable example in each case)</div>	½+½  ½+½  ½+½												
5.	(a) <div style="text-align: center;">  </div>													

	 <p>(ii) <math>R-NH_2 + CHCl_3 + 3KOH \xrightarrow[\text{alc.}]{\Delta} RNC + 3KCl + 2H_2O</math></p> <p>(iii) <math>R-CONH_2 + Br_2 + 4KOH \xrightarrow[\text{alc./aq.}]{} R-NH_2 + K_2CO_3 + 2KBr + 2H_2O</math></p> <p>(Balancing of equation is not necessary)</p>	1×3
5.	<p style="text-align: center;"><b>OR</b></p> <p>(b) (i) <math>A = CH_3CH_2CN</math>      <math>B = CH_3CH_2CH_2NH_2</math>      <math>C = CH_3CH_2CH_2OH</math></p> <p>(ii) <math>A = CH_3CONH_2</math>      <math>B = CH_3CH_2NH_2</math>      <math>C = CH_3CH_2NH-SO_2-C_6H_5</math></p>	<p><math>\frac{1}{2} \times 3</math></p> <p><math>\frac{1}{2} \times 3</math></p>
6.	<p>(i) <math>CH_3-C(=O)-CH_2-CH_2-CH_3</math></p> <p>(ii) <math>CH_3-C(=O)-CH_2-CH_2-CH_3 + H_2N-NH-C_6H_3(NO_2)_2 \longrightarrow</math></p> <p style="text-align: center;">           (Product)       </p> <p>(iii) <math>CH_3-CH_2CH_2COONa + CHI_3</math></p>	<p>1</p> <p>1</p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p>
7.	<p>(a) (i) <math>t_{2g}^3 e_g^1</math></p> <p>(ii) <math>d sp^2</math>, diamagnetic</p> <p>(iii) <math>[CoCl_2(en)_2]^+</math></p>	<p>1</p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p> <p>1</p>
7.	<p style="text-align: center;"><b>OR</b></p> <p>(b) (i) <math>[Ni(H_2O)_6]Cl_2</math></p> <p>(ii) 6</p> <p>(iii) hexaaquanickel(II) chloride</p>	<p>1</p> <p>1</p> <p>1</p>
8.	<p>(a) (i) Due to lanthanoid contraction / poor shielding by 4f orbitals.</p> <p>(ii) Due to incomplete filling of d orbitals / participation of both (n-1) d and ns</p>	

	orbitals. (iii) No unpaired electrons in 3d subshell / weak metallic bonding.	1 x 3
8.	<p style="text-align: center;"><b>OR</b></p> <p>(b) *Variable or multiple oxidation state / ability to form complexes / they provide large surface area for adsorption (utilises (n-1) d and ns electrons for bonding). *In transition elements the oxidation states differ from each other by unity while in non-transition elements it differs by a unit of two / Heavier members of transition elements are stable in higher oxidation states whereas that of p-block are stable in lower oxidation states. *Mn shows +2, +3, +4, etc. oxidation states whereas Pb shows +2 and +4 oxidation states.  (Any other suitable reason and example)</p>	<p>1</p> <p>1</p> <p>1</p>
9.	<p>(a) <math>\Delta_r G^\circ = -nFE_{\text{cell}}^\circ</math>  <math>= +300 \times 10^3 \text{ J mol}^{-1} = +2 \times 96500 \text{ C mol}^{-1} \times E_{\text{cell}}^\circ</math>  <math>E_{\text{cell}}^\circ = \frac{300 \times 10^3}{2 \times 96500} \text{ V}</math>  <math>E_{\text{cell}}^\circ = 1.55 \text{ V}</math>  (Deduct ½ mark for incorrect unit or no unit)</p> <p>(b) <math>\Lambda_m^\circ = \lambda_{\text{Mg}^{2+}}^\circ + 2\lambda_{\text{Cl}^-}^\circ</math>  <math>\Lambda_m^\circ = (106 + 2 \times 76.3) \text{ S cm}^2 \text{ mol}^{-1}</math>  <math>\Lambda_m^\circ = (106 + 152.6) \text{ S cm}^2 \text{ mol}^{-1}</math>  <math>\Lambda_m^\circ = 258.6 \text{ S cm}^2 \text{ mol}^{-1}</math></p>	<p>½</p> <p>½</p> <p>1</p> <p>½</p> <p>½</p>
10.	<p>(i) <math>\text{Fe}^{2+}</math>, Fe is more stable in <math>\text{Fe}^{3+}</math> due to half-filled <math>d^5</math> configuration.</p> <p>(ii) <math>\text{Cu}^{2+}</math>, due to high <math>\Delta_{\text{hyd}}H^\circ</math> of <math>\text{Cu}^{2+}</math> than <math>\text{Cu}^+</math>.</p> <p>(iii) <math>\text{Zn}^{2+}</math>, no unpaired electrons / no d-d transition.</p>	<p>½+½</p> <p>½+½</p> <p>½+½</p>
11.	<p><math>t_{1/2} = 0.693/k</math>  <math>k = 0.693/t_{1/2} = 0.693/40 \text{ min}^{-1}</math>  90% completion  <math>t = 2.303/k \log [R_0]/[R]</math>  <math>= 2.303/0.693 \times 40 \times \log 100/10</math>  <math>= 2.303/0.693 \times 40 = 132.9 \text{ min}</math>  (Deduct ½ marks if no or incorrect unit)  (or any other correct method)</p>	<p>½</p> <p>½</p> <p>1</p> <p>1</p>
12.	<p>(a) <math>\text{C}_6\text{H}_5\text{COCH}_3 &lt; \text{CH}_3\text{COCH}_3 &lt; \text{CH}_3\text{CHO} &lt; \text{HCHO}</math></p> <p>(b) On heating with Tollens' reagent, ethanal forms silver mirror whereas propanone does not. (Or any other correct chemical test)</p> <p>(c) Because of resonance by —OH of COOH which reduces the electrophilicity of carboxyl carbon / Because of resonance in COOH group due to which carbon loses its carbonyl nature.</p>	<p>1</p> <p>1</p> <p>1</p>

	<p>(d) (i) due to strong electron withdrawing effect of the carbonyl group and resonance stabilization of the conjugate base.</p> <p>(ii)  + </p> <p style="text-align: center;"><b>OR</b></p> <p>(i) </p> <p>(ii) </p>	<p>1+ 1</p> <p>1</p> <p>1</p>
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