Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Senior Secondary School Supplementary Examination, July-2025
SUBJECT NAME: CHEMISTRY SUBJECT CODE:043 PAPER CODE: 56(B)/S

General Instructions: -

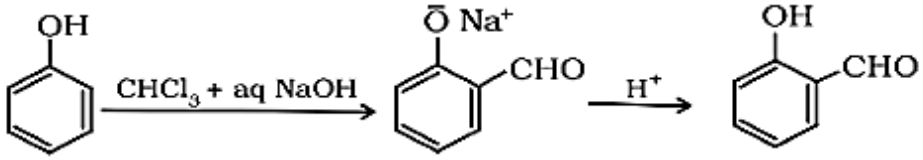
1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested 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 various rules of the Board and 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 due marks be awarded to them. In class-XII, 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, due marks should be awarded.**
4	The Marking scheme carries only suggested value points for the answers. These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
5	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. If there is any variation, the same should be zero after deliberation and discussion. 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.
6	Evaluators will mark(√) wherever answer is correct. For wrong answer CROSS 'X" be marked. Evaluators will not put right (✓)while evaluating which gives an impression that answer is correct and no marks are awarded. **This is most common mistake which evaluators are committing.**
7	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.
8	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.
9	If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out with a note **"Extra Question"**.
10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.

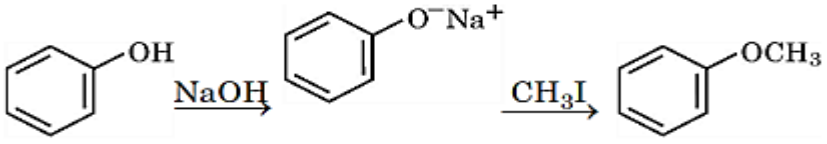
11	A full scale of marks 70 has to be used. Please do not hesitate to award full marks if the answer deserves it.
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past: - Giving more marks for an answer than assigned to it. ● Wrong totalling of marks awarded on an answer. ● Wrong transfer of marks from the inside pages of the answer book to the title page. Wrong question wise totalling on the title page. ● Leaving answer or part thereof unassessed in an answer book. ● Wrong totalling of marks of the two columns on the title page. ● Wrong grand total. ● Marks in words and figures not tallying/not same. ● 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.
14	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.
15	Any un assessed 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.
16	The Examiners should acquaint themselves with the guidelines given in the "**Guidelines for spot Evaluation**" before starting the actual evaluation.
17	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.
18	The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.

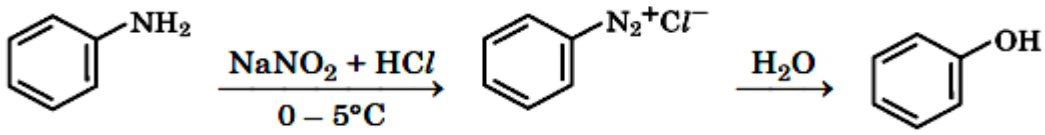
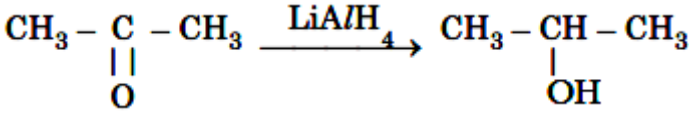
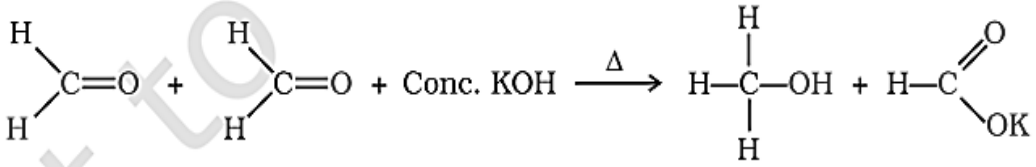
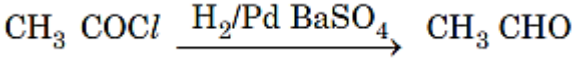
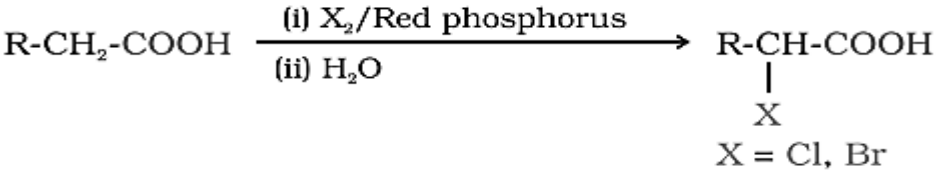
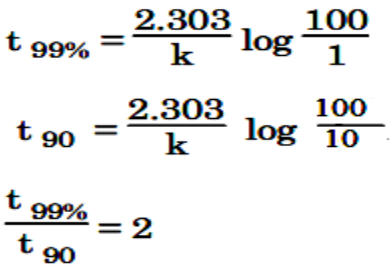
MARKING SCHEME 2025

CHEMISTRY (Theory)- 043

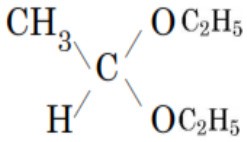
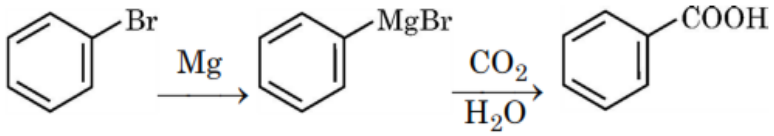
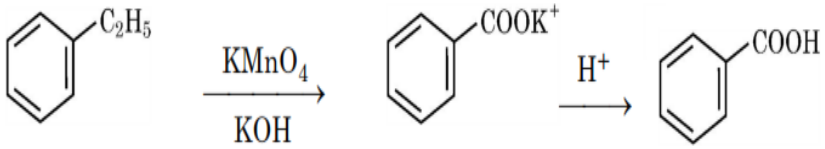
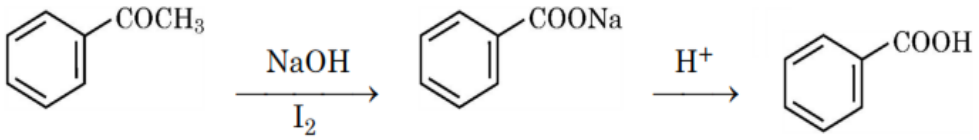
QP CODE 56 (B)/S

Q. No.	Value points	Mark
	SECTION A	
1.	(D)	1
2.	(B)	1
3.	(A)	1
4.	(B)	1
5.	(D)	1
6.	(B)	1
7.	(A)	1
8.	(B)	1
9.	(D)	1
10.	(A)	1
11.	(B)	1
12.	(C)	1
13.	(A)	1
14.	(C)	1
15.	(D)	1
16.	(D)	1
	SECTION B	
17.	• A binary liquid mixture which distils at constant temperature without undergoing a change in composition. • Maximum boiling azeotropes.	1 1
18.	(a) (i) The rate becomes double. (ii) No change.	1 1
	OR	
	(b) Because complex reactions are made up of multiple steps, the molecularity of each step is different. Hence, molecularity is not applicable for complex reactions. As order is determined from the slowest step of the multiple steps and hence it is applicable for both elementary and complex reactions.	1 1
19.	NH_3 being a strong field ligand, pairs up the four unpaired electrons and hence is diamagnetic, while F^- is a weak field ligand and does not pair up the unpaired 4 electrons and hence is paramagnetic.	1+1
20.	(a) When alkyl halide reacts with sodium alkoxide, ether is formed / $Na^+ O^- R' + CH_3 - Cl \rightarrow CH_3 - OR' + NaCl$ (b) When phenol reacts with $CHCl_3$ and a*queous* NaOH, salicylaldehyde is formed /  	1 1

21.	(i) Linkage which joins two amino acids through –CONH- bond. (ii) Loss of biological activity when protein is subjected to either physical or chemical change or a change in pH, temperature, etc.	1 1
	SECTION C	
22.	**Kohlrausch's Law:** Limiting molar conductivity is equal to the sum of the individual contributions of cation and anion. **'B'** is a strong electrolyte. On dilution, there is a slight increase in the number of ions of strong electrolytes.	1 1 1
23.	$\frac{p^o - p}{p^o} = \frac{W_B}{M_B} \times \frac{M_A}{W_A}$ $\frac{32 - 31.84}{32} = \frac{5}{M_B} \times \frac{18}{100}$ $\frac{0.16}{32} = \frac{5}{M_B} \times \frac{18}{100}$ $M_B = \frac{5}{0.16} \times \frac{18}{100} \times 32$ $M_B = 180\ gmol^{-1}$	1 1 1
24.	(a) The energy required to separate the degenerate d-orbitals into t_{2g} and e_g sets when ligands approach the central metal atom/ion. $Ti^{3+} = 3d^1\ (t_{2g}^1)$ Due to excitation of electron from $t_{2g} \rightarrow e_g$, the energy (or wavelength) lies in the visible region and gives colour / due to d-d transition.	1 1 1
	OR	
	(b) (i) Linkage isomerism (ii) $\Delta_t = (4/9)\ \Delta_o$ (iii) Ambidentate ligand	1 1 1
25.	(a) **Fibrous protein:** When the polypeptide chains run parallel and are held together by hydrogen and disulphide bonds. **Globular protein**: When the chains of polypeptides coil around to give a spherical shape. (b) **Nucleotide**: Base + Sugar + Phosphate **Nucleoside:** Base + Sugar (c) **Essential amino acids:** The amino acids which are required in our diet. **Non-essential amino acids**: The amino acids which are synthesised in our body. (Or any other one suitable difference).	1 1 1
26.	(a) Phenyl magnesium bromide is formed. (b) Benzyl alcohol is formed. (c) 2,4,6–trinitrophenol / Picric acid is formed. **(Or structures)**	1 1 1
27.	(a)  (b)	1

		1
	(c)  (Award full marks in case the conversions are expressed in the statements).	1
28.	(a) Aldehydes which do not have an α-hydrogen atom, on heating with concentrated alkali, form alcohol and carboxylic acid salt.  (b) Acid chloride is hydrogenated over a catalyst, palladium on barium sulphate to form corresponding aldehyde.  (c) Carboxylic acids having an α-hydrogen are halogenated at the α-position on treatment with chlorine or bromine in the presence of small amount of red phosphorus to give α-halocarboxylic acids.  (or any other suitable example)	1 1 1
	SECTION D	
29.	(a) (i) p-nitroaniline < Aniline < p-toluidine (ii) $C_6H_5NH_2 < (C_2H_5)_2NH < C_2H_5NH_2$ (b) (i) Due to resonance, the electron pair on nitrogen in aniline is less available for protonation than that of methylamine.	1 1 1
	OR	
	(b) (ii) Primary amines are prepared by treating an amide with bromine in an aqueous or ethanolic solution of sodium hydroxide, with the loss of the carbon atom of the amide. (c) On heating with $CHCl_3$ and KOH, methylamine gives a foul smell of isocyanide, while Dimethylamine does not. (or any other suitable chemical test)	1 1
30.	(a) 	½ ½ 1

	(b) (i) Catalyst, temperature, surface area, concentration of the reactants. (any **two**).	½, ½
	OR	
	(b) (ii) Because for this reaction, the activation energy is very high. (c) A catalyst lowers the activation energy.	1 1
	SECTION E	
31.	(a) (i) (I) Because of small size, high ionic charge and availability of d-orbitals. (II) Because Cr is more stable in Cr^{3+} due to a stable t_{2g}^{3} configuration, while Mn is more stable in +2 due to a stable half-filled ($3d^5$) configuration. (III) Because of ability of oxygen to stabilise higher oxidation states through multiple bonds with metal. (ii) $2MnO_2 + 4KOH + O_2 \rightarrow 2K_2MnO_4 + 2H_2O$ $3MnO_4^{2-} + 4H^+ \rightarrow 2MnO_4^- + MnO_2 + 2H_2O$ (Award full marks in case the preparation is expressed in the statements).	1 1 1 1 1
	OR	
31.	(b) (i) (I) Fe^{2+} (II) Zn^{2+} (ii) The steady decrease in the atomic radii in 5d series or lanthanoid series with an increase in atomic number. Due to the poorer shielding effect of 5f orbital over 4f orbital. (iii) (I) $Cr_2O_7^{2-}$ (II) CrO_4^{2-}	1 1 1 1 ½, ½
32.	(a) (i) $E_{Cell} = E^{o}_{Cell} - \frac{0.059}{2}\log\frac{|Sn^{2+}|}{|H^+|^2}$ $= +0.14 - \frac{0.059}{2}\log\frac{|10^{-3}|}{|10^{-2}|^2}$ $= 0.14 - \frac{0.059}{2}\log 10$ $= 0.14 - 0.0295$ $= 0.11\ V$ **(Deduct ½ mark for no or incorrect unit)** (ii) A Galvanic cell which converts the energy of combustion of fuel directly into electrical energy. High efficiency, pollution free.	1 1 1 1 ½, ½
	OR	
	(b) $\Lambda_m = \frac{k}{C} \times 1000\ S\,cm^2\,mol^{-1}$ $= \frac{3.905 \times 10^{-5}}{0.001} \times 1000$ $= 39.05\ S\,cm^2\,mol^{-1}$	1

	$\Lambda m^\circ = \lambda^\circ_{H^+} + \lambda^\circ_{CH_3COO^-}$ $= 349.6 + 40.9$ $= 390.5 \text{ S cm}^2 \text{ mol}^{-1}$ $\alpha = \frac{\Lambda m}{\Lambda m^\circ} = \frac{39.05}{390.5} = 0.1$ (ii) The cell which converts chemical energy directly into electrical energy. A galvanic cell will turn to an electrolytic cell.	1 1 1 1
33.	(a) (i) (I) $CH_3 - CH = NNHCONH_2$ / Ethanal semicarbazone is formed. (II) Ethane / C_2H_6 is formed. (III)  / Ethanal acetal is formed. (ii) (I) C_6H_5-$COCH_3$ on heating with NaOH & I_2 will give yellow ppt. of CHI_3, whereas C_6H_5-CHO will not. (II) CH_3-CHO on heating with NaOH & I_2 will give yellow ppt. of CHI_3, whereas CH_3-CH_2CHO will not. (Or any other suitable chemical test)	1 1 1 1 1
	OR	
	(b) (i) (I)  (II)  (III)  (Award full marks in case the conversions are expressed in the statements) (ii) (I) $CH_3COOH < F-CH_2-COOH < O_2N-CH_2-COOH$ (II) Propanone < Ethanal < Methanal	1 1 1 1 1