Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Senior School Certificate Examination, 2024-25
SUBJECT NAME **CHEMISTRY (Theory) -043**
(Q.P.CODE 56/2/2) MM: 70

General Instructions: -

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.

"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."

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-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, due marks should be awarded.**

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.

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 delibration 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.

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.**

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 totaled up and written in the left-hand margin and encircled. This may be followed strictly.

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.

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"**.

No marks to be deducted for the cumulative effect of an error. It should be penalized only once.

A full scale of marks _____(example 0 to 80/70/60/50/40/30 marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.

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).This is in view of the reduced syllabus and number of questions in question paper.

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 an answer.
- 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/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.

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.

Any unassessed portion, non-carrying over of marks to the title page, or totaling 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.

The Examiners should acquaint themselves with the guidelines given in the "**Guidelines for Spot Evaluation**" before starting the actual evaluation.

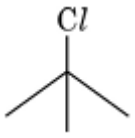
Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.

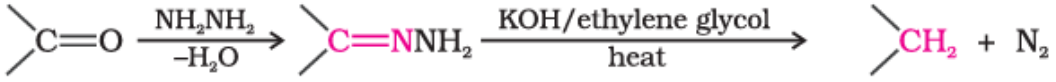
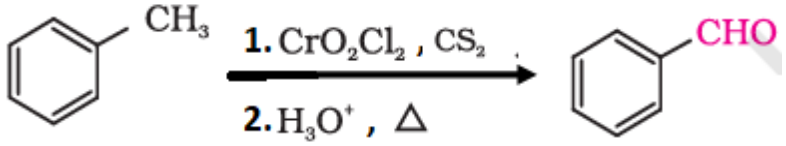
The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.

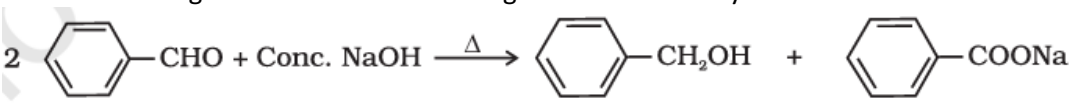
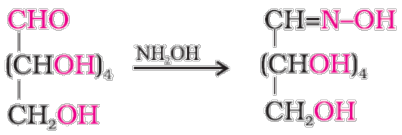
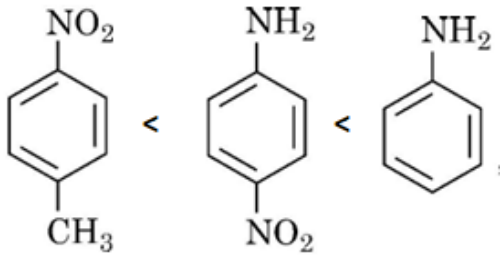
MARKING SCHEME 2024-25

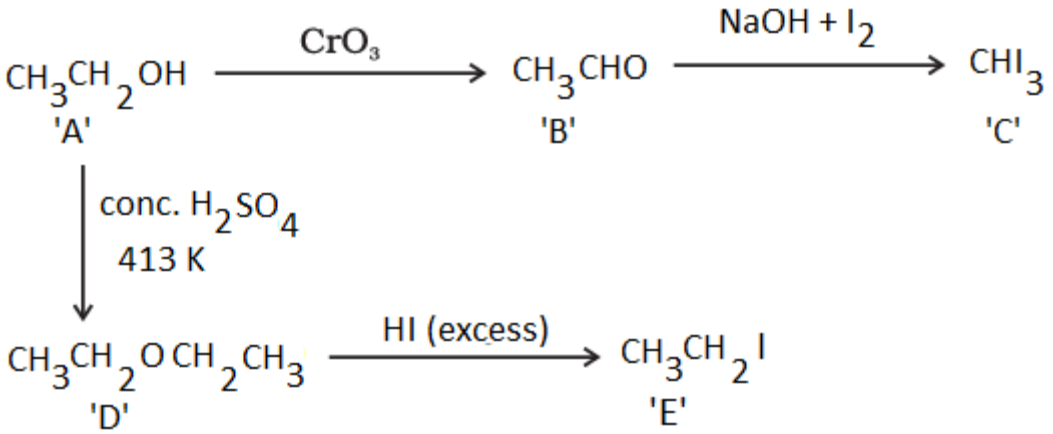
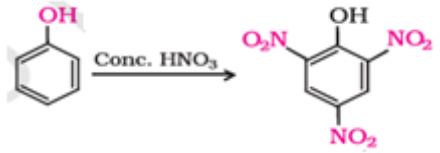
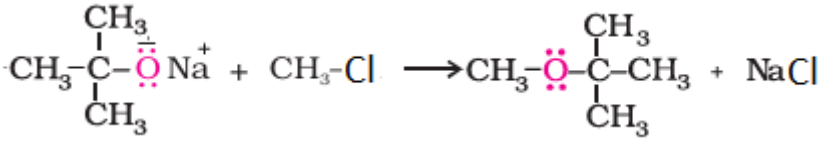
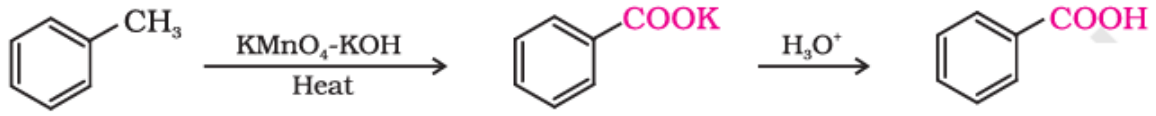
CHEMISTRY (Theory)- 043

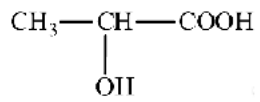
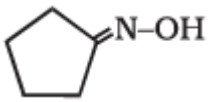
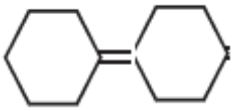
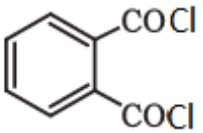
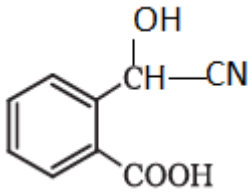
QP CODE 56/2/2 **MM: 70**

Q. No	Value points	Mark
	SECTION A	
1	**(D)**	**1**
2	**(A)**	**1**
3	**(A)**	**1**
4	**(D)**	**1**
5	**(C)**	**1**
6	**(D)**	**1**
7	**(D)**	**1**
8	**(C)**	**1**
9	**(B)**	**1**
10	**(C)**	**1**
11	**(A)**	**1**
12	**(B)**	**1**
13	**(A)**	**1**
14	**(C)**	**1**
15	**(C)**	**1**
16	**(B)**	**1**
	SECTION B	
17	(a)  , due to the formation of more stable tertiary carbocation. (b) 2-Bromo-2-methylbutane < 2-Bromopentane < 1-Bromopentane.	½ , ½ 1
18	(i) Rate = $k[2R]^2$ Rate=4 times (ii) Rate = $k[R/2]^2$ Rate = ¼ times	1 1
19	(A) = Na_2CrO_4 / Sodium chromate (B) = $Na_2Cr_2O_7$ / Sodium dichromate (C) = $K_2Cr_2O_7$ / Potassium dichromate (D) = Na_2SO_4 / Sodium sulphate	½ x 4
20	In case of $[Co(NH_3)_6]^{3+}$, presence of NH_3, the 3d electrons pair up leaving two d orbitals empty to be involved in d^2sp^3 hybridisation forming inner orbital complex. In $[Ni(NH_3)_6]^{2+}$, Ni is in +2 oxidation state and has d^8 configuration, the hybridization involved is sp^3d^2 forming outer orbital complex.	1 1
21	$k = \frac{[R]_0 - [R]}{t}$ $t = \frac{0.10 - 0.075}{0.0030}$ $t = \frac{0.025}{0.0030}$ $t = 8.33\ s$	½ 1 ½
	OR	

21	Rate = $\frac{-1}{2}\frac{\Delta[NH3]}{\Delta t} = \frac{\Delta[N2]}{\Delta t} = \frac{+1}{3}\frac{\Delta[H2]}{\Delta t}$ $\frac{-1}{2}\frac{\Delta[NH3]}{\Delta t} = \frac{\Delta[N2]}{\Delta t} = \frac{+1}{3}\frac{\Delta[H2]}{\Delta t}$ = k $\frac{\Delta[N2]}{\Delta t}$ = 2.5 x 10^{-4} mol L^{-1} s^{-1} $\frac{\Delta[H2]}{\Delta t}$ = 3 x 2.5 x 10^{-4} = 7.5 x 10^{-4} mol L^{-1} s^{-1}	½ ½ ½ ½
	SECTION C	
22	$\pi_{Glucose} = \pi_{Urea}$ $C_G = C_U$ $\frac{W_G}{M_G} = \frac{W_U}{M_U}$ $\frac{W_G}{180} = \frac{15}{60}$ $W_G = \frac{15\times180}{60}$ $= 45\ g$ (Deduct ½ mark for no or incorrect unit)	½ ½ 1 1
23	$\Lambda^o_{m(HAc)} = \Lambda^o_{m(HCl)} + \Lambda^o_{m(NaAc)} - \Lambda^o_{m(NaCl)}$ $= (426 + 91 - 126)$ $= 391\ S\ cm^2\ mol^{-1}$ $\alpha = \frac{\Lambda_m}{\Lambda^o_m}$ $= \frac{48.1}{391}$ $= 0.123$	1 1 ½ ½
24	(a) Because Mn^{2+} is more stable due to stable $3d^5$ configuration whereas Cr^{3+} is more stable due to stable t_{2g}^3 configuration. (b) Similar atomic radii of 4d and 5d series elements Separation of lanthanoids becomes difficult. (Or any other correct consequences) (c) Zinc, due to weak interatomic interactions / Weak metallic bond.	1 ½, ½ ½ , ½
25	(a) Dichloridobis(ethane-1,2-diamine) iron(III) ion (b) Tetraammineaquabromidocobalt(III) sulphate (c) Tetracyanidonickelate(II) ion	1 1 1
26.	(A) (a) The carbonyl group of aldehydes and ketones is reduced to CH_2 group on treatment with hydrazine followed by heating with sodium or potassium hydroxide in high boiling solvent such as ethylene glycol  (b) Chromyl chloride oxidises methyl group of toluene to a chromium complex, which on hydrolysis gives corresponding benzaldehyde. 	½ ½ ½ ½

	(c) Aldehydes which do not have α-hydrogen atom, undergo self-oxidation and reduction reaction on heating with concentrated alkali gives salt of carboxylic acid and alcohol  (Or any other example)	½ ½
	OR	
26	(B) (a) A = CH_3COCl (b) CH_3CHO (c) $CH_3CH{=}NNH_2$ (b) A = CH_3CHO (b) $CH_3CH(OH)CH_2CHO$ (c) $CH_3CH{=}CHCHO$	½ x 3 ½ x 3
27	(a) (i) The stereoisomers related to each other as non-superimposable mirror images. (ii) A mixture containing dextro and laevo enantiomers in equal proportions. (b) C—Cl bond acquires a partial double bond character due to resonance / the carbon atom of benzene attached to halogen is sp^2-hybridised / Explanation through resonating structures.	1 1 1
28	(a)  (b) Due to the presence of zwitter ion structure it can react with acids and bases./ Due to the presence of both carboxylic group and amino group. (c) It is water soluble vitamin and is excreted in urine.	1 1 1
	SECTION D	
29	(a)  / Award full marks if attempted because of printing error. (b) Due to resonance in aniline the lone pair of electrons are less available while they are easily available in methyl amine. (c) (i) $NH_3 < (CH_3)_3N < CH_3NH_2 < (CH_3)_2NH$ OR (ii) A mixture of primary, secondary and tertiary amines and also a quaternary ammonium salt is formed.	2 1 1
30	(a) • When external pressure is larger than the osmotic pressure, then the movement of solvent is from solution to solvent side through semi permeable membrane. / The direction of osmosis can be reversed if a pressure larger than the osmotic pressure is applied to the solution side. • Cellulose acetate / Or any other suitable example. (b) (i) RBC swells up / Cells swell and may even burst due to endo-osmosis. **OR** (ii) 1 M KCl, i = 2 / KCl dissociates into ions, whereas urea does not dissociate. (c) It depends upon the number of solute particles in the solution.	1 1 1 ½ ½ 1
	SECTION E	
31	**(A) A =** CH_3CH_2OH / Ethanol / Ethyl alcohol, B = CH_3CHO / Ethanal / Acetaldehyde,	½ x 5

	C = CHI_3 / Iodoform / Triiodomethane, D = $CH_3CH_2O\ CH_2\ CH_3$ / Ethoxyethane / Diethyl ether, E = CH_3CH_2I / Ethyl iodide / Iodoethane. 	½ x 5
	OR	
31	(B) (a) (i)  (ii)  (iii)  (b) On heating with NaOH + I_2, Butan-2-ol gives yellow ppt. Of iodoform (CHI_3) whereas Butan-1-ol does not. (Or any other suitable chemical test) (c) Ethanol < Water < Phenol.	1 1 1 1 1
32	(a) But-2-enal (b) On heating with NaOH + I_2, propanone gives yellow ppt. Of iodoform (CHI_3) whereas propanal does not. (Or any other suitable chemical test) (c) (i) 	1 1 1

	(ii) $CH_3CH_2OH \xrightarrow{PCC} CH_3CHO \xrightarrow[2.\ H_3O^+]{1.\ CH_3MgBr} CH_3CH(OH)CH_3$ (iii) $CH_3CH_2CHO \xrightarrow{KMnO4/\ H+} CH_3CH_2COOH \xrightarrow{Cl2\ ,\ Red\ Phosphorous} CH_3CH(Cl)\text{-}COOH \xrightarrow{NaOH\ (aq)}$  (Or any other correct method)	1 1
	OR	
32	(B) (a)  (b)  (c)  (d)  (e) CH_3COCl / Anhy. $AlCl_3$ or $(CH_3CO)_2O$/ Anhy. $AlCl_3$	1 × 5= 5
33	(A) (a) $E^o_{cell} = E^o_{cathode} - E^o_{anode}$ = - 2.87 − 1.5 V = **- 4.37 V** $\triangle G^0 = -nF\ E^o c_{ell}$ = -6 x 96500 X (-4.37) = 2530.230 kJ/mol Reaction is non-spontaneous. (b) Yes, the tarnish can be removed. Aluminium has more negative standard electrode potential than silver so will reduce silver sulphide to silver, tarnish will be removed. **/** $3\ Ag^+ + Al \longrightarrow 3\ Ag + Al^{3+}$ $E^o c_{ell} = E^o_{cathode} - E^o_{anode}$	 ½ ½ 1 1 1 1

	= - 0.71 −(-1.66) V = 0.95 V This indicates that the reaction is feasible and tarnish can be removed.	
	OR	
33	(B) (a) (i) Potential difference between two electrodes of a galvanic cell. (ii) The galvanic cell in which combustion energy of fuels is directly converted into electrical energy. b) n =2 $E^o_{cell} = E^o_{cathode} - E^o_{anode}$ = - 0.40 −(-0.76) V = 0**.36 V** $E_{Cell} = E^o_{celi} - \frac{0{\cdot}059}{2} log \left[\frac{Zn^{2+}}{Cd^{2+}}\right]$ $= [0.36] - \frac{0{\cdot}059}{2} log \frac{0{\cdot}1}{0{\cdot}01}$ $= (0 \cdot 36 - 0 \cdot 0295)$ $= 0{\cdot}3305\ V$	1 1 1 1 1