Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Senior School Certificate Examination, 2024-25
SUBJECT NAME **CHEMISTRY (Theory) -043**
(Q.P.CODE 56/4/2) 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.

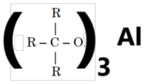
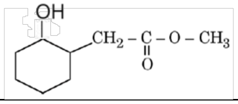
Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.

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 56/4/2 **MM: 70**

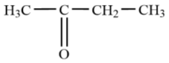
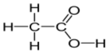
Q.No	Value points	Mark
	SECTION A	
1	**(C)**	**1**
2	**(D)**	**1**
3	**(D)**	**1**
4	**(B)**	**1**
5	**(A)**	**1**
6	**(A)**	**1**
7	**(B)**	**1**
8	**(D)**	**1**
9	**(B)**	**1**
10	**(C)**	**1**
11	**(C)**	**1**
12	**(B)**	**1**
13	**(C)**	**1**
14	**(D)**	**1**
15	**(C)**	**1**
16	**(D)**	**1**
	SECTION B	
17	• Amino-acids which cannot be synthesized in the body and must be obtained through diet. • In zwitter ionic form, amino-acids react both with acids and bases./ Due to the presence of both carboxylic group and amino group.	1 1
18	Order of the reaction =1 / First Rate =k[A]	1 1
	OR	
18	Rate of the reaction will increase. Rate constant remains same.	1 1
19	Structural formula: $K_2[PtCl_6]$ IUPAC Name: Potassium hexachloridoplatinate(IV)	1 1
20	Galvanic cell which converts the energy of combustion of fuels directly into electrical energy. Advantages 1.High efficiency 2.Pollution free (or any other two correct advantages)	1 ½ x2=1
21	a)  b) 	1 1
	SECTION C	
22(a)	(a)No Sodium methoxide is a strong nucleophile as well as a strong base so elimination reaction of t-butyl bromide predominates over substitution. Methyl bromide and Sodium.t-butoxide / CH_3Br and $(CH_3)_3CONa$	½ ½ ½ , ½

<table>
<tr><td></td><td>(b)2-methoxy-2-methylpropane</td><td>1</td></tr>
<tr><td>23</td><td>(a) $C_2H_5)_2NH < C_2H_5NH_2 < C_6H_5NHCH_3 < C_6H_5NH_2$
(b) $C_2H_5OH > C_2H_5NH_2 > (CH_3)_2NH$
(c) $C_2H_5NH_2 > (C_2H_5)_2NH_2 > C_6H_5NH_2$</td><td>1
1
1</td></tr>
<tr><td>24</td><td>$2Al + 3\ Ni^{2+} \rightarrow 2Al^{3+} + 3Ni$
$E^\circ_{cell} = E^\circ_{Ni2+/Ni} - E^\circ_{Al3+/Al}$;$E^\circ cell = -0.25-(-1.66) = 1.41V$
n=6
$E_{cell} = E^\circ cell - \frac{2.303RT}{nF} \log \frac{[Al^{3+}]^2}{[Ni^{2+}]^3}$
$E_{cell} = 1.41 - \frac{0.059}{6} \log \frac{[0.001]^2}{[0.001]^3}$
$E_{cell} = 1.41 - \frac{0.059}{6} \log \frac{[10^{-3}]^2}{[10^{-3}]^3}$
$E_{cell} = 1.41 - \frac{0.059}{6} \log 10^3$
$E_{cell} = 1.41 - 0.0295$
$E_{cell} = 1.3805V$ (Deduct ½ marks for no or incorrect unit)</td><td>½
½

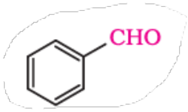
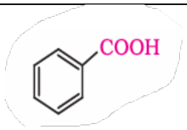
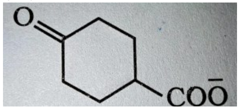
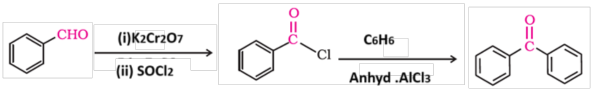
1

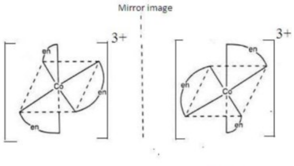
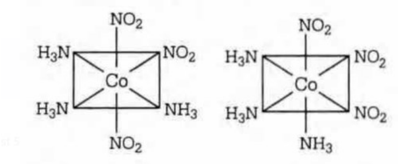
1</td></tr>
<tr><td>25</td><td>a)(i) Greater stability of allylic carbocation due to resonance.
(ii)Being covalent in nature, only nitrogen is free to donate electron pair in AgCN.
(iii)Less sterically hindered carbon in Methyl chloride/ greater steric hinderance on tertiary carbon of t-butyl chloride.</td><td>1
1
1</td></tr>
<tr><td></td><td>OR</td><td></td></tr>
<tr><td>25</td><td>b)(i) A =$CH_3CH_2CH_2Br$ B = $CH_3CH_2CH_2OH$
(ii) A = $CH_3CH=CHCH_3$ B= $CH_3CH_2CH(Br)CH_3$
(iii)A = CH_3CH_2Cl B= CH_3CH_3</td><td>½ x
6=3</td></tr>
<tr><td>26.</td><td>(a)Change from Mn^{3+} to Mn^{2+} results in extra stable half filled d^5 configuration.
Cr^{2+} is reducing as its configuration changes from d^4 to d^3 which is stable half filled t_{2g}^3 configuration.
(b)Due to poorer shielding offered by 5f electrons than 4f.
(c)H, B, C and N atoms being small in size get trapped inside the crystal lattices of transition metals.</td><td>½
½
1
1</td></tr>
<tr><td>27</td><td>i=Normal molar mass/Abnormal molar mass
i=40/25
=1.6
α= i-1/n-1
$= \frac{1.6-1}{1}$
=0.6 x100
=60% (Any other suitable method)</td><td>½

1
½

1</td></tr>
<tr><td>28</td><td>A:  $H_3C-C(=O)-CH_2-CH_3$ Butan-2-one
B : CHI_3 Triiodomethane
C :  CH_3COOH Ethanoic acid</td><td>½ + ½
½ + ½
½ + ½</td></tr>
<tr><td></td><td>SECTION D</td><td></td></tr>
<tr><td>29</td><td>(a)2-Deoxyribose, Phosphoric acid, Nitrogenous base.
<table>
<tr><th>DNA</th><th>RNA</th></tr>
<tr><td>1.Double stranded helix</td><td>Single stranded helix</td></tr>
</table>
(or any other suitable structural difference)
(b)
<table>
<tr><th>Nucleotide</th><th>Nucleoside</th></tr>
</table></td><td>1
1</td></tr>
</table>

<table>
<tr><td></td><td><table><tr><td>1.Pentose sugar+ Nitrogenous base + Phosphate</td><td>1.Pentose sugar+ Nitrogenous base</td></tr></table>(c)
(i) To preserve genetic information and Protein synthesis
OR
(c)(ii)Phosphodiester linkage
Uracil</td><td>1
1
½ + ½</td></tr>
<tr><td>30</td><td>(a)Chloroform and Acetone (or Any other correct example)
A-B interactions are stronger than A-A and B-B interaction.
(b)(i) For any solution the partial vapour pressure of each volatile component is directly proportional to its mole fraction.
OR
(b)(ii) $p = p^0 x_1$; $p = K_H\ x$
When $p^0 = K_H$
p α χ for both.
(c) The enthalpy of mixing of the pure components in the ideal solution is Zero/$\Delta_{mix}H=0$.
The Volume of mixing of the pure components in the ideal solution is Zero. /$\Delta_{mix}V=0$
(or any other two suitable characteristics)</td><td>1
1
1
1
½ + ½</td></tr>
<tr><td></td><td>SECTION E</td><td></td></tr>
<tr><td>31</td><td>(a)
(i)
$k = \frac{2\cdot303}{t}\ \log\frac{[R]_0}{[R]}$
$k = \frac{2\cdot303}{60}\ \log\frac{1.2\ x\ 10^{-2}}{0.2\ x\ 10^{-2}}$
$= \frac{2\cdot303}{60}\ \log 6$
$= \frac{2\cdot303}{60}\ x\ 0.778$
k= 2.98 x 10^{-2} min^{-1} / 0.0298 min^{-1} (Deduct ½ mark for incorrect or no unit.)
(ii)
(I) Order is determined experimentally.
If one of the reactants is taken in excess.</td><td>1
1
1
1
1</td></tr>
<tr><td></td><td>OR</td><td></td></tr>
<tr><td>31</td><td>(b)(i)
$\log\frac{k_2}{k_1} = \frac{E_a}{2\cdot303R}\left[\frac{1}{T_1} - \frac{1}{T_2}\right]$
$\log\frac{2k_1}{k_1} = \frac{E_a}{19\cdot15}\left[\frac{1}{298} - \frac{1}{308}\right]$
$0\cdot3 = \frac{E_a}{19\cdot15}\left[\frac{10}{298\times308}\right]$
$E_a = \frac{0\cdot3\times19\cdot15\times298\times308}{10}$
E_a= 52729 $Jmol^{-1}$ or 52.729 $kJmol^{-1}$ (Deduct ½ mark for incorrect or no unit.)
(ii)
(1). Rate= k[H_2O_2] [I^-]
(2) Overall order : 2/ Second
Molecularity : 2 / Bimolecular</td><td>1
1
1
1
½
½</td></tr>
</table>

32	(a)(i) (I)  	1
	(II) CH_3COCH_3	1
	(III)  	1
	(ii) (I)Benzoic acid with Sodium bicarbonate gives brisk effervescence. No reaction with Ethyl benzoate	1
	(ii)Propanal, when heated with ammoniacal solution of silver nitrate (Tollens' reagent) gives silver mirror. No reaction with propanone (or any other suitable chemical test)	1
	OR	
32	(b)(i)(I)  	1
	(II)1.$(BH_3)_2$, 2.H_2O_2/OH^- , 3.PCC	1
	(III)  	1
	(b)(ii) (I)  	1
	(II) $C_6H_5CHO \xrightarrow{CH_3CHO,\ dil\ NaOH\ ,\Delta} C_6H_5CH{=}CHCHO \xrightarrow{H_2/Ni} C_6H_5CH_2CH_2CH_2OH$ (Or any other suitable method)	1
33	(a)(i) (I)CO being a strong field ligand, causes pairing of electrons therefore, there is no unpaired electron. Whereas Cl^- is a weak field ligand, does not cause pairing, therefore presence of unpaired electrons.	1
	(II) CO can form both sigma (σ) and pi (π)bond with central metal atom/Metal to ligand bonding creates synergic effect between CO and the Metal.	1
	(III) Mirror images are superimposable/ Presence of plane of symmetry.	1
	(ii) (I)$\Delta_O > P$, causes pairing of electrons, therefore 1 unpaired electron	1
	(II) $\Delta_O < P$, No pairing of electrons therefore 5 unpaired electrons	1
	OR	
33	(b)(i) (I)Coordination Isomerism / $[Cr(NH_3)_6]\ [Co(CN)_6]$	½ , ½

	(II)Optical Isomerism /  *l*-form *d*-form	½ , ½
	(III)Geometrical isomerism /  	½ , ½
	(ii) Weak field ligands produce weak field and leads to small splitting of d-orbitals whereas strong field ligands produce strong field leading to large splitting of d-orbitals.	1
	Strong field ligands cause pairing of electrons/a smaller number of unpaired electrons hence produces low spin complexes and weak field ligands causes no pairing of electrons/ a greater number of unpaired electrons hence produces high spin complexes.	1