Senior Secondary School

Term–II, Compartment Examination, 2022

Marking Scheme: CHEMISTRY (Subject Code: 043)

[Paper Code: 56/6/2] [SET-2]

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 totaled 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 the 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 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.

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 totaled 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.
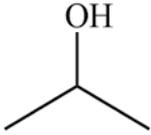
MARKING SCHEME
Senior Secondary School Examination TERM–II, 2022
CHEMISTRY (Subject Code–043)
[Paper Code: 56/6/1]

Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks
	SECTION—A	
1.	(a) First order.	1
	(b)	
	<table><tr><th>Order</th><th>Molecularity</th></tr><tr><td>The sum of powers of the concentration of the reactants in the rate law expression is called the order of a reaction.</td><td>The number of reacting species (atoms, ions or molecules) taking part in an elementary chemical reaction.</td></tr><tr><td>Order of a reaction can be zero or fraction or negative.</td><td>The Molecularity of a reaction cannot be zero or fraction or negative.</td></tr></table> (Any one) or (any other correct difference)	1
2.	(a) Molar conductivity of a solution at a given concentration is the conductance of the volume V of solution containing one mole of electrolyte kept between two electrodes with area of cross section A and distance of unit length / Conductivity observed for one molar solution.	
	(b) $S\ cm^2\ mol^{-1}$	
	(c) Λ_m decreases with an increase in concentration or increases with decrease in concentration. (Any two)	1 X 2
3.	(a) $C_6H_5COOH < FCH_2COOH < NO_2CH_2COOH$	1
	(b) Butanal / Butan-1-al	1
	SECTION—B	
4.	$\Lambda_m = \dfrac{K \times 1000}{c}$	½
	$= \dfrac{3.905\ X\ 10^{-5}\ X\ 1000}{0.001}$	½
	$= 39.05\ S\ cm^2\ mol^{-1}$ (Deduct ½ marks if no or incorrect unit)	1
	Degree of dissociation	
	$\alpha = \dfrac{\Lambda_m}{\Lambda_{m°}}$	½
	$= \dfrac{39.05}{390.5} = 0.1$	½

5.	(a) The movement of colloidal particles under an applied electric potential.	
	(b) Yes.	1
	(c) The process of settling colloidal particles is coagulation / The process of	1
	converting colloidal solution into precipitate.	1
	OR	
5.	(a) Adsorption: The accumulation of molecular species at the surface rather	
	than in the bulk of a solid or liquid is termed adsorption.	
	(b) Lyophobic sol: The dispersed phase has little or no affinity for the	
	dispersion medium / solvent-repelling sols.	
	(c) Multimolecular colloid: On dissolution, a large number of atoms or smaller	
	molecules of a substance aggregate together to form species having the size	
	in the colloidal range (1–1000 nm).	1 x 3
6 (a)	(i) +3	1
	(ii) Due to the poor shielding effect of d-electrons and increase in effective	
	nuclear charge.	1
	(iii) V^{3+} : 2 unpaired electrons, Ti^{3+}: 1 unpaired electron.	½ , ½
	OR	
6 (b)	(i) Ce^{3+} = [Xe] $4f^{1}$ = 1 unpaired electron	
	$$\mu = \sqrt{n(n+2)}$$	½
	$$\mu = \sqrt{1(1+2)} = \sqrt{3} \qquad = 1.73\ B\ M$$	½
	(ii) Copper in +2 oxidation state has incompletely filled d-orbital.	1
	(iii) Sc^{3+} has no unpaired electrons / no d-d transition / d^0 configuration	
	whereas in Ti^{3+} with one unpaired electron shows d-d transition.	1
7 (a)	(i) Zero order	1
	(ii) -k	1
	(iii) mol L^{-1} s^{-1}	1
	OR	
7 (b)	$k = \dfrac{0.693}{24} = 0.0288$ min^{-1}	½
	$t = \dfrac{2.303}{k} \log \dfrac{a}{a-x}$	½
	$t = \dfrac{2.303}{0.0288} \log \dfrac{100}{100-25}$	
	$t = \dfrac{2.303}{0.0288} \log \dfrac{4}{3}$	
	$t = 79.96\ (\log 4 - \log 3)$	1
	$t = 79.96 \times 0.125$	
	$= 9.99$ min	1
	(Deduct ½ marks if no or incorrect unit)	
	OR	
	$k = \dfrac{0.693}{24}$ min^{-1}	½
	$\dfrac{0.693}{24} = \dfrac{2.303}{t} \log \dfrac{a}{a-x}$	½

	$= \dfrac{2.303}{t} \log \dfrac{100}{100-25}$ $t = \dfrac{2.303 \times 24}{0.693} \log \dfrac{4}{3}$ t = 79.75 (log 4 – log 3) t = 79.75 x 0.125 = 9.97 min (Deduct ½ marks if no or incorrect unit)		1 1
8.	(a) $CH_3CH_2\,NHCH_2CH_3$ (b) A = $C_6H_5NH_2$, B = $C_6H_5NHCOCH_3$		1 1 1
9.	(a) hexaamminecobalt(III) chloride (b) tetrachloridonicklate (II) (c) Potasssium hexacyanidoferrate (III)		1 1 1
10.	(a) Due to incompletely filled d-orbitals / due to the participation of both (n-1) d and ns electrons. (b) Due to high $\Delta_aH°$ and low $\Delta_{hyd}H°$. (c) Cr^{3+} is more stable in +3 oxidation state due to t_{2g}^3 configutaion.		1 1 1
	OR		
10.	• The steady decrease in the atomic / ionic radii of the lanthanoid series with the increase in atomic number. • (i) 4d and 5d series elements have almost identical atomic radii. (ii) Difficulty in the separation of Lanthanoids. (iii) Similar physical and chemical properties. (iv) Basic character of the lanthanide hydroxides $M(OH)_3$ decreases with increase in atomic number. (Any two consequences)		1 1 x 2
11.	(a) Aryl halides do not undergo nucleophilic substitution with the anion formed by phthalimide. (b) In aniline, due to resonance lone pair of electrons on N is less available while it is easily available in alkyl amines due to electron donating nature (+I effect) of alkyl group / Due to electron withdrawing nature of the aryl group in aniline while electron donating nature of alkyl group in alkyl amine. (c) $C_2H_5NH_2 < (C_2H_5)_3\,N < (C_2H_5)_2NH$		1 1 1
12.	(a) Ethanal (b) On heating with Tollens' reagent, propanal forms a silver mirror whereas propanone does not. (Or any other suitable chemical test) (c) PCC (d) (i) A = OH structure / Propan-2-ol, B = CH_3COCH_3 / Propanone /Acetone		1 1 1

	C = $\underset{\underset{CH_3}{|}}{CH_3-C}=N-NH_2$ / Propanone hydrazone	½ x 4
	D = CHI_3 / Iodoform	

OR

	(d)(ii) (I)	1
	$$\underset{}{>}C=O \xrightarrow[HCl]{Zn-Hg} >CH_2 \ + \ H_2O$$ (or any other suitable reaction)	
	(II) $$R-CH_2-COOH \xrightarrow[\text{(ii) } H_2O]{\text{(i) } X_2/\text{Red phosphorus}} \underset{\underset{X}{|}}{R-CH-COOH}$$ X = Cl, Br (or any other suitable reaction)	1

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