Strictly Confidential: (For Internal and Restricted use only)
Senior School Certificate Examination-2020
Marking Scheme – CHEMISTRY
(SUBJECT CODE -043) (PAPER CODE – 56(B))

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. **Evaluation is a 10-12 days mission for all of us. Hence, it is necessary that you put in your best efforts in this process.**
2. 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.**
3. 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.
4. 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.**
5. 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.
6. 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.
7. If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out.
8. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
9. A full scale of marks 0-70 has to be used. Please do not hesitate to award full marks if the answer deserves it.
10. 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).
11. 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.

12. 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.

13. 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.

14. The Examiners should acquaint themselves with the guidelines given in the Guidelines for spot Evaluation before starting the actual evaluation.

15. 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.

16. 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.

56(B)

MARKING SCHEME

Sr. SECONDARY SCHOOL EXAMINATION, 2020

Subject: CHEMISTRY (043)

Q.No.	Expected Answer / Value Points	Distribution of Marks
1.	The ionization potential / enthalpy of oxygen and xenon are nearly same.	1
2.	Xe, lower I.E. of xenon than that of He.	½ + ½
3.	Due to high inter-electronic repulsions.	1
4.	$2\ XeF_2 + 2\ H_2O \longrightarrow 2\ Xe + 4HF + O_2$	1
5.	Used in Fluorescent lamps / Neon Sign boards / Botanical gardens / Green houses (any one)	1
6.	Because the overall reaction does not involve any ion in the solution.	1
7.	Zinc has lower reduction potential than copper due to which zinc is oxidized and Cu^{2+} ions are reduced. / Zn being more reactive than copper, displaces Cu^{2+} ions from the solution	1
8.	Pentaamminechloridoplatinum(IV) chloride	1
9.	Due to –I effect of halogens.	1
10.	3 (three)	1
11	A	1
12	C	1
13	B	1
14	A	1
15	D	1
16	i	1
17	i	1

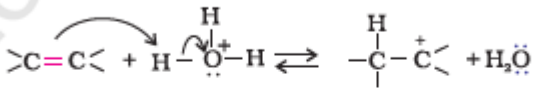
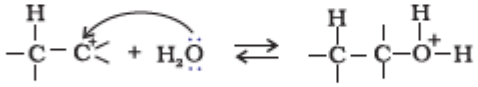
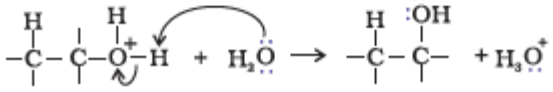
<table>
<tr><td>18</td><td>iii</td><td>1</td></tr>
<tr><td>19</td><td>i / ii</td><td>1</td></tr>
<tr><td>20</td><td>iii</td><td>1</td></tr>
<tr><td>21.</td><td>Due to lowering of vapour pressure of solution.
Because it depends on molality / number of solute particles.</td><td>1
1</td></tr>
<tr><td></td><td>OR</td><td></td></tr>
<tr><td>21.</td><td>Due to osmosis. / Due to inward movement of water molecules.
Yes, osmosis is directly proportional to temperature of solvent.</td><td>1
1</td></tr>
<tr><td>22.</td><td><table><tr><th>Order</th><th>Molecularity</th></tr><tr><td>i. Sum of powers to which, the concentration terms are raised in a rate law.</td><td>The number of reacting species colliding simultaneously in an elementary step.</td></tr><tr><td>ii. May also be zero/ fraction/negative</td><td>It is always a positive whole number.</td></tr></table>(or any other difference.)
OR
(a). Due to decrease in concentration of reactants with time .
(b). Due to more surface area.</td><td>1
1

1
1</td></tr>
<tr><td>23.</td><td>(a). It acts as a flux to remove Iron oxide as slag.
(b). It acts as a reducing agent.</td><td>1
1</td></tr>
<tr><td>24.</td><td>(a). Because solute particle size is extremely small.
(b). Due to coagulation of blood.</td><td>1
1</td></tr>
<tr><td>25.</td><td>A= $(CH_3)_2CHCH_2Br$
B=$(CH_3)_2C=CH_2$
C=$(CH_3)_3CBr$
D=$(CH_3)_2CHCH_2CH_2CH(CH_3)_2$</td><td>4×½=2</td></tr>
<tr><td>26.</td><td>(a).
 
(b).$CH_3CHO \xrightarrow[2.\ H_2O]{1.\ CH_3MgBr} (CH_3)_2CHOH$</td><td>1

1</td></tr>
<tr><td>27.</td><td><table><tr><th>Homopolymers</th><th>Co-polymers</th></tr><tr><td>Polymers whose repeating structural units are derived from only one type of monomer.</td><td>Polymers whose repeating structural units are derived from two or more types of monomers.</td></tr><tr><th>Thermoplastic Polymers</th><th>Thermosetting Polymers</th></tr><tr><td>They are linear polymers without cross linking and branching.</td><td>There is extensive cross linking.</td></tr></table>(or any other correct difference.)</td><td>1

1</td></tr>
<tr><td>28.</td><td>$\Delta T_f = i\ K_f\ m = \frac{i\ K_f . w_B \times 1000}{M_B w_A}$
i = 3
$2 = 3 \times 1.86 \times \frac{w_B}{111} \times \frac{1000}{500}$
$w_B = \frac{2 \times 111 \times 500}{3 \times 1.86 \times 1000} = 19.89g$</td><td>½
½
1
1</td></tr>
</table>

28.	**OR** For dilute solutions: $\frac{P_A^O - P_S}{P_A^O} = \frac{w_B}{M_B} \times \frac{M_A}{w_A}$ $\frac{23.75-23.375}{23.75} = \frac{5}{M_B} \times \frac{18}{95}$ $M_B = \frac{5 \times 18}{95} \times \frac{23.75}{0.375} = 60\ gmol^{-1}$	1 1 1
29.	k = $\frac{0.693}{t_{\frac{1}{2}}}$ $= \frac{0.693}{2\ min}$ $0.3465 min^{-1}$ t = $\frac{2.303}{K} \log \frac{[A]_0}{[A]}$ $= \frac{2.303}{0.3465} \log \frac{100}{10}$ t = $\frac{2.303}{0.3465\ min^{-1}} \times \log 10$ $= \frac{2.303}{0.3465} \times 1$ $= 6.6$ min (deduct half mark if no or incorrect unit)	½ ½ ½ ½ 1
	OR	
29.	Rate = k [A] $[B]^2$ (i) Rate = k [A] $[3B]^2$ = 9k [A]$[B]^2$ So the rate increases by nine times. (ii) Rate = k [2A] $[2B]^2$ = 8k [A] $[B]^2$ So the rate becomes eight times.	1 1 1
30.	(a). Both ΔS and ΔH are –ve but ΔH > TΔS, so ΔG is –ve. (b). Due to the coagulation of colloidal clay particles. (c). In case of high fever the enzyme activity is reduced.	1 1 1
31.	(a). In test tube (iii), containing sulphur powder. $3\ S + 2\ H_2SO_4 \xrightarrow{heat} 3\ SO_2 + 2\ H_2O$ (b). In test tube (i), containing cane sugar. $C_{12}H_{22}O_{11} + H_2SO_4 \xrightarrow{\Delta} 12C + 11H_2O$ (c). In test tube (ii), containing copper turnings $Cu + 2\ H_2SO_4 \xrightarrow{\Delta} CuSO_4 + SO_2 + 2H_2O$	½ + ½ ½ + ½ ½ + ½

32.	**Step 1: Protonation of alkene to form carbocation by electrophilic attack of H_3O^+.** $H_2O + H^+ \rightarrow H_3O^+$  **Step 2: Nucleophilic attack of water on carbocation.**  **Step 3: Deprotonation to form an alcohol.** 	1 1 1
33.	(i) A $\rightarrow CH_3CHO$, B $\rightarrow CH_3–CH = N–OH$ (ii) A $\rightarrow CH_3COOH$, B $\rightarrow CH_3COCl$ (iii) A $\rightarrow C_6H_5COONa$, B $\rightarrow C_6H_6$	½ + ½ ½ + ½ ½ + ½
34.	(a). Tranquilizers (b). Antihistamines / Antacids (c). Highly branched hydrocarbon chains	1 1 1
35.	E cell = $E^0cell - \frac{0.0591}{n}\log\frac{[A^{2+}]}{[B^{2+}]}$ $2.6805 = E^0cell - \frac{0.0591}{2}\log 10^{-1}$ $= E^0cell - 0.0295 \times (-1)$ $= E^0cell + 0.0295$ $E^0cell = 2.6805 - 0.0295 = 2.651$ V $\Delta G^o = -nFE^o_{cell}$ $= -2 \times 96500 \times 2.651$ $= -511643$ J mol^{-1} or -511.643 kJmol^{-1}	½ 1 ½ 1 ½ ½ 1
	OR	
35.	(a). Area (A) = $\pi r^2 = 3.14 \times (0.5\ cm)^2 = 0.785\ cm^2$ Length (l) = 50 cm = 0.5 m. $R = \rho \cdot \frac{l}{A}$ or $\rho = \frac{R \times A}{l}$ $= \frac{5.55 \times 10^3 \times 0.785 cm^2}{50\ cm}$ $\rho = 87.135$ ohm cm. $k = \frac{1}{\rho}$ $= \frac{1}{87.135} Scm^{-1}$ $= 0.01148\ Scm^{-1}$ $\Lambda m = \frac{k \times 1000}{M}$	½ ½ ½ ½ ½

	$= \frac{0.011488\ cm^{-1} \times 1000 cm^3 L^{-1}}{0.05\ mol\ L^{-1}}$ Λm = 229.6 S cm^2 mol^{-1} (b). (i) Fuel cells are pollution free while thermal plants are major source of pollution / Fuel cells are more efficient. (ii) Zinc being more reactive will oxidise itself to protect iron.	½ 1 1
	SECTION-D	
36.	(a). $4\ FeCr_2O_4 + 8\ Na_2CO_3 + 7\ O_2 \rightarrow 8\ Na_2CrO_4 + 2\ Fe_2O_3 + 8\ CO_2$ $2Na_2CrO_4 + 2\ H^+ \rightarrow Na_2Cr_2O_7 + 2\ Na^+ + H_2O$ (b). (i) Due to comparable energies of 5f, 6d and 7s orbitals. (ii) Due to higher oxidation state of Mn in Mn_2O_7. (iii) Due to d-d transitions / due to presence of unpaired electrons in d-orbitals.	1 1 1 1 1
	OR	
36.	(a). $2MnO_2 + 4KOH + O_2 \rightarrow 2K_2MnO_4 + 2H_2O$ $3MnO_4^{2-} + 4H^+ \rightarrow 2MnO_4^- + MnO_2 + 2H_2O$ / $MnO_4^{2-} \rightarrow MnO_4^- + e^-$ (during electrolytic oxidation at anode) (b). (i) Due to almost similar sizes / comparable sizes. (ii) Because 5f electrons in actinoids have more poor shielding effect. (iii) Because Cr^{3+} has the stable t_{2g}^3 configuration whereas Mn^{2+} has stable ($3d^5$) configuration.	1 1 1 1 1
37.	A = $C_6H_5CONH_2$, B= $C_6H_5N_2Cl$ C= C_6H_5CN D= C_6H_5NC E= C_6H_6 (Or any other answer for option E only)	1 1 1 1 1
	OR	
37.	(a). (i) Add $CHCl_3$ and KOH (alc.) to both the compounds. Aniline gives foul smelling isocyanides while N-Methylaniline doesn't. (ii) Add Ice cold ($NaNO_2$ + HCl) followed by phenol or β-Naphthol to both the compounds. Aniline forms orange red dye while ethylamine doesn't. (Or any other suitable chemical test) (b). (i) A = $C_6H_5NH_2$, B =  (ii) A = CH_3OH , B = CH_3Cl (iii) A = C_2H_5NC , B = $C_2H_5NH.CH_3$	1 1 ½ + ½ ½ + ½ ½ + ½