Strictly Confidential: (For Internal and Restricted use only)
Senior School Certificate Examination-2020
Marking Scheme – CHEMISTRY
(SUBJECT CODE -043) (PAPER CODE – 56/1/1,2,3)

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.

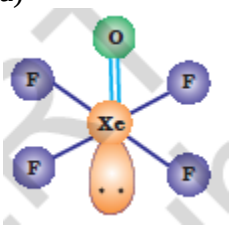
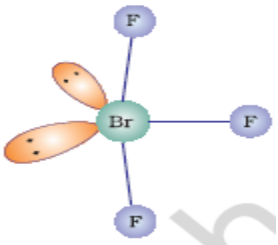
56/1/1 – Set

MARKING SCHEME

Sr. SECONDARY SCHOOL EXAMINATION, 2020

Subject: CHEMISTRY

Q.No.	Expected Answer / Value Points	Distribution of Marks
	SECTION - A	
1.	Racemic Mixture	1
2.	Polarimeter	1
3.	Pent-2-ene / $CH_3CH=CHCH_2CH_3$	1
4.	Antiseptic	1
5.	$CH_3I + C_6H_5OH$	1
6.	A	1
7.	Zn	1
8.	No	1
9.	$CH_2=CH-Cl$	1
10.	Branched hydrocarbon part	1
11.	B	1
12.	D	1
13.	C	1
14.	C	1
15.	A	1
16.	iii	1
17.	ii	1
18.	i	1
19.	ii	1
20.	i	1

	SECTION – B	
21.	(a) The drugs which are used to control stress / anxiety / tension / mild or severe mental diseases	1
	(b) The drugs which are used to kill or to prevent the growth of micro-organism, applied externally on living tissues.	1
	OR	
21	Soap molecules form micelle around the oil droplet or dirt in such a way that hydrophobic part interacts with the oil droplet and hydrophilic part projects out. Micelles can be washed away on rinsing with water. Thus soap helps in emulsification and washing away of oil and fats.	2
22.	$\pi = CRT$ (Volume of solution = 100 mL)	½
	$\pi = \frac{n}{V} RT$	
	$\pi = \frac{5}{60} \times \frac{0.0821 \times 300}{0.1}$	½
	$\pi = 20.5$ atm. (½ mark may be deducted for no or incorrect unit)	1
	OR	
22.	ΔT_f (urea) = ΔT_f (Z)	½
	$kf \times \frac{w\ urea}{Murea} \times \frac{1000}{w\ solvent} = kf \times \frac{wz}{Mz} \times \frac{1000}{Wsolvent}$	½
	$\frac{7.5}{60} \times \frac{1000}{100} = \frac{42.75}{Mz} \times \frac{1000}{100}$	
	$Mz = \frac{42.75 \times 60}{7.50} = 342\ g/mol$ (or by any other correct method)	1
	(½ mark may be deducted for no or incorrect unit)	
23.	(a) 1st order	1
	(b) No, due to exponential relation / the curve never touches the x-axis.	½ + ½
24.	a) 	1
	b) 	1
25.	(a) $K_2[Zn(OH)_4]$	1
	(b) $[Pt(NH_3)_6]Cl_4$	1
26.	a) $(CH_3)_3C$-OH / tertiary butyl alcohol is formed.	1

	b) $C_6H_5COCH_3$ / acetophenone is formed (or correct chemical equation)	1
27.	a) C_6H_5OH + HCHO , Phenol + formaldehyde b) CH_2= C(Cl) – CH=CH_2, Chloroprene	½ + ½ ½ + ½
	SECTION - C	
28.	(a) (A) → CH_3CONH_2 (B) → CH_3NH_2 (b) (A) → $C_6H_5NH_2$ (B) → $C_6H_5N_2Cl$ (c) (A) → C_6H_5CN (B) → C_6H_5COOH	½ + ½ ½ + ½ ½ + ½
28	**OR** a) (i) 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. ii) Add $CHCl_3$ and KOH (alc.) to both the compounds. Aniline gives foul smelling isocyanide while N-Methylaniline doesn't. (or any other suitable chemical test) b) Butanol > Butanmine > Butane	1 1 1
29.	(a) Because the – CHO group in glucose is involved in hemiacetal formation and thus is not free / due to cyclic structure of glucose -CHO group is not free. (b) Because the hydrogen bonds are formed between specific pairs of bases. (c) Starch is a polymer of α - glucose while cellulose is a polymer of β - glucose.	1 1 1
30.	(a) Because sulphur readily gets oxidized itself to more stable +6 state. (b) Because of absence of d-orbital in Fluorine. (c) Because size increases from Helium to Radon. / dispersion or van der Waal forces increase from Helium to Radon.	1 1 1
30	**OR** (a) MnO_2+ 4HCl → $MnCl_2$ + Cl_2 + $2H_2O$ (b) XeF_6 + KF → $K^+[XeF_7]^-$ (c) $4I^-_{(aq.)} + 4H^+_{(aq.)} + O_{2(g)} \rightarrow 2I_{2(s)} + 2H_2O_{(l)}$	1 1 1
31.	(a) NaCN act as a depressant. (b) SiO_2 act as a flux. / used to remove FeO as slag (c) I_2 is used to convert Ti into volatile compound (TiI_4).	1 1 1
32.	**Physisorption** 1. It arises because of van der Waals' forces. 2. It is not specific in nature. 3. It is reversible in nature. **Chemisorption** 1. It is caused by chemical bond formation. 2. It is highly specific in nature. 3. It is irreversible. (or any other correct differences)	1 x 3

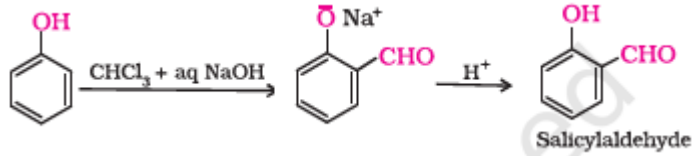
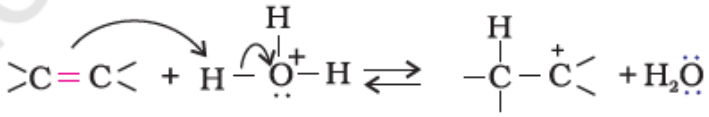
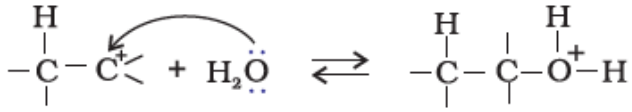
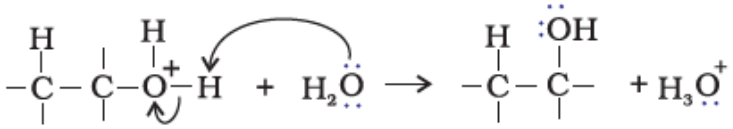
33.	(a) Decreases. (b) Increases (c) Increases	1 1 1
34.	$\Delta T_f = K_f \ m$ $1.5 = \frac{3.9 \times w_B}{176} \times \frac{1000}{75}$ Mass of ascorbic acid = 5.08 g.	1 1 1
	SECTION – D	
35	(a) $E^0cell = E^o_C - E^o_A$ $= 0.34 - (-0.76)$ $= 1.10V$ $\Delta G^o = -nFE^o$ $= -2 \times 1.10 \times 96500$ $= -212300$ J/mol or -212.3 kJ/mol (b) (i) Pollution free (ii) High efficiency.	½ ½ ½ ½ 1 1 1
	OR	
35.	(a) (i) Silver wire at 30°C because as temperature decreases, resistance decreases so conduction increases. (ii) 0.1 M CH_3COOH, because on dilution degree of ionization increases hence conduction increases. (iii) KCl solution at 50°C, because at high temperature mobility of ions increases and hence conductance increases	1 1 1
	(b) **Electrochemical** / **Electrolytic** (1) Anode -ve, Cathode +ve / Anode +ve, Cathode -ve (2) Convert chemical Energy to electrical energy / Convert electrical Energy to chemical energy (or any other correct differences)	1 1

36.	(a) (i) $Cu^{+1}(3d^{10})$ compounds are white because of absence of unpaired electrons while Cu^{+2} $(3d^9)$ compounds are coloured due to unpaired e^- / shows d-d transition.	1
	(ii) chromate (CrO_4^{2-}) changes to dichromate ($Cr_2O_7^{2-}$) ion in acidic medium.	1
	(iii) due to completely filled d-orbitals in their ground state as well as in oxidized state.	1
	(b) Co = $[Ar]4s^2 3d^7$, Co^{+2} =$[Ar]\ 3d^7$ $\mu = \sqrt{n(n+2)}$ $= \sqrt{3(3+2)} = \sqrt{15} = 3.92\ B.M.$	½ + ½ ½ ½
	OR	
36.	(a)	1x3

Lanthanoids	**Actinoids**
(1) most of them are not radioactive	All are radioactive
(2) don't show a wide range of oxidation state	Show a wide range of oxidation states
(3) Most of their ions are colourless	Most of their ions are coloured

(or any other correct differences)

(b) (i) Sc^{+3}, because of absence of unpaired electron.	½ + ½
(ii) Cr, because of presence of strong intermetallic bonding than Cu.	½ + ½

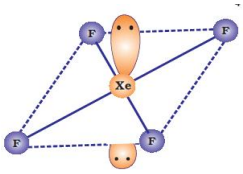
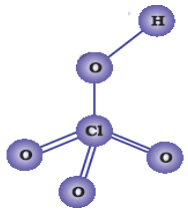
37.	(a) Tert-butyl alcohol, because it forms more stable 3^o carbocation than 1^o carbocation. (b) i)	1 1 1
	 Salicylaldehyde	
	ii) $(CH_3)_3CCl + NaOH_{(aq.)} \rightarrow (CH_3)_3COH \xrightarrow{Na} (CH_3)_3CONa$ $\downarrow C_2H_5Cl$ $(CH_3)_3COC_2H_5$	1
	iii) $CH_3CH=CH_2 \xrightarrow[ii)\ H_2O_2/OH^-]{i)\ B_2H_6} CH_3CH_2CH_2OH$	1
	(or by any other suitable method)	
	OR	
37.	a)	
	Step 1: Protonation of alkene to form carbocation by electrophilic attack of H_3O^+. $H_2O + H^+ \rightarrow H_3O^+$	
		1
	Step 2: Nucleophilic attack of water on carbocation.	
		½
	Step 3: Deprotonation to form an alcohol.	
		½
	b) i) $K_2Cr_2O_7 + H_2SO_4$ / $Na_2Cr_2O_7 + H_2SO_4$ ii) Br_2 in CH_3COOH iii) Br_2 aq. / Bromine water	1 1 1

56/1/2 – Set – I

MARKING SCHEME

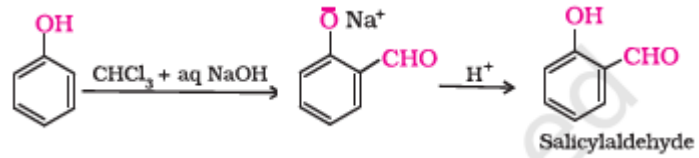
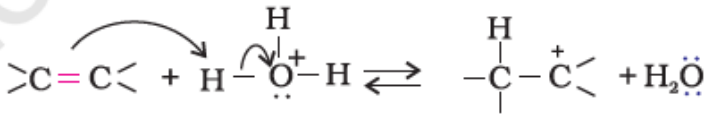
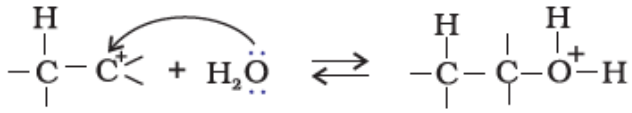
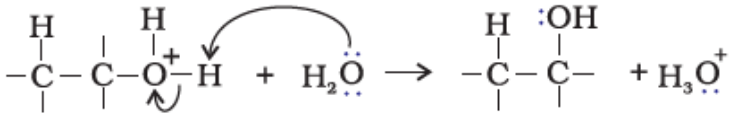
SR. SECONDARY SCHOOL EXAMINATION, 2020

Subject: CHEMISTRY

Q.No.	Expected Answer / Value Points	Distribution of Marks
	SECTION - A	
1.	Inversion	1
2.	$CH_3I + C_6H_5OH$	1
3.	But-2-ene / $CH_3CH=CHCH_3$	1
4.	Polarimeter	1
5.	Antiseptic	1
6.	Branched hydrocarbon part	1
7.	$CH_3CH=CH_2$	1
8.	A	1
9.	No	1
10.	Zn	1
11.	A	1
12.	C	1
13.	C	1
14.	B	1
15.	B	1
16.	i	1
17.	i	1
18.	iii	1
19.	ii	1
20.	ii	1
	SECTION – B	
21.	(a) 1^{st} order (b) No, due to exponential relation / the curve never touches the x-axis.	1 1
22.	a.  b.  	1 1
23.	(a) The drugs which are used to control stress / anxiety / tension / mild or severe mental diseases (b) The drugs which are used to kill or to prevent the growth of micro-organism, applied externally on living tissues.	1 1

	OR Soap molecules form micelle around the oil droplet or dirt in such a way that hydrophobic part interacts with the oil droplet and hydrophilic part projects out. Micelles can be washed away on rinsing with water. Thus soap helps in emulsification and washing away of oil and fats.	2
24.	(a) $K_3[Al(C_2O_4)_3]$ (b) $[Co(NH_3)_4(H_2O)Cl]Cl_2$	1 1
25.	$\pi = CRT$ (Volume of solution = 100 mL) $\pi = \frac{n}{V} RT$ $\pi = \frac{5}{60} \times \frac{0.0821 \times 300}{0.1}$ π = 20.5 atm. (½ mark may be deducted for no or incorrect unit) **OR** ΔT_f (urea) = ΔT_f (Z) $kf \times \frac{w\ urea}{Murea} \times \frac{1000}{w\ solvent} = kf \times \frac{wz}{Mz} \times \frac{1000}{Wsolvent}$ $\frac{7.5}{60} \times \frac{1000}{100} = \frac{42.75}{Mz} \times \frac{1000}{100}$ $Mz = \frac{42.75 \times 60}{7.50} = 342\ g/mol$ (or by any other correct method) (½ mark may be deducted for no or incorrect unit)	½ ½ 1 ½ ½ 1
26.	a. $NH_2(CH_2)_6NH_2$ – Hexamethylenediamine, $HOOC(CH_2)_4COOH$ – Adipic acid b. CH_2=CH-CH=CH_2 – Butadiene, C_6H_5CH=CH_2 – Styrene	½+½ ½+½
27.	a. 2-Methylbutan-2-ol / $(CH_3)_2C(OH)CH_2CH_3$ is formed / $CH_3COCH_2CH_3 \xrightarrow[ii)\ H_2O]{i)\ CH_3MgBr} (CH_3)_2C(OH)CH_2CH_3$ b. Benzene / C_6H_6 is formed $C_6H_5COONa \xrightarrow{NaOH + CaO,\ \Delta} C_6H_6$	1 1
	SECTION - C	
28.	$\Delta T_f = K_f\ m$ $1.5 = \frac{3.9 \times w_B}{176} \times \frac{1000}{75}$ Mass of ascorbic acid = 5.08 g.	1 1 1
29.	(a) Because sulphur readily gets oxidized itself to more stable +6 state. (b) Because of absence of d-orbital in Fluorine. (c) Because size increases from Helium to Radon. / dispersion or van der Waal forces increase from Helium to Radon.	1 1 1

29	**OR** (a) $MnO_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$ (b) $XeF_6 + KF \rightarrow K^+[XeF_7]^-$ (c) $4I^-_{(aq.)} + 4H^+_{(aq.)} + O_{2(g)} \rightarrow 2I_{2(s)} + 2H_2O_{(l)}$	1 1 1
30.	(a) (A) $\rightarrow CH_3CONH_2$ (B) $\rightarrow CH_3NH_2$ (b) (A) $\rightarrow C_6H_5NH_2$ (B) $\rightarrow C_6H_5N_2Cl$ (c) (A) $\rightarrow C_6H_5CN$ (B) $\rightarrow C_6H_5COOH$	½ + ½ ½ + ½ ½ + ½
30	**OR** a) (i) 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. ii) Add $CHCl_3$ and KOH (alc.) to both the compounds. Aniline gives foul smelling isocyanides while N-Methylaniline doesn't. (or any other suitable chemical test) b) Butanol > Butanmine > Butane	1 1 1
31.	(a) Because the – CHO group in glucose is involved in hemiacetal formation and thus is not free / due to cyclic structure of glucose -CHO group is not free. (b) Because the hydrogen bonds are formed between specific pairs of bases. (c) Starch is a polymer of α - glucose while cellulose is a polymer of β - glucose.	1 1 1
32.	(a) Increases (b) Decreases (c) Increases	1 1 1
33. a.	**Physiorption** / **Chemisorption** (i) Not specific / Highly specific (ii) Low $\Delta H_{adsorption}$ / High $\Delta H_{adsorption}$	1 1
b.	In adsorption, the substance is concentrated only at the surface while in absorption, the substance is uniformly distributed throughout the bulk of the solid / adsorption is a surface phenomenon while absorption is a bulk phenomenon	1
34.	(a) It converts Ni into its volatile compound, $Ni(CO)_4$. (b) It provides flux to remove impurities. (c) It selectively prevents one of the sulphide ore from coming to the froth.	1 1 1
	SECTION – D	
35.	(a) Tert-butyl alcohol, because it forms more stable 3^o carbocation than 1^o carbocation. (b) i)	1 1

	 Salicylaldehyde	1
	ii) $(CH_3)_3CCl + NaOH_{(aq.)} \rightarrow (CH_3)_3COH \xrightarrow{Na} (CH_3)_3CONa \xrightarrow{C_2H_5Cl} (CH_3)_3COC_2H_5$	1
	iii) $CH_3CH=CH_2 \xrightarrow[iv)\ H_2O_2/OH^-]{iii)\ B_2H_6} CH_3CH_2CH_2OH$	1
	(or by any other suitable method)	
	OR	
	Step 1: Protonation of alkene to form carbocation by electrophilic attack of H_3O^+. $H_2O + H^+ \rightarrow H_3O^+$ 	1
	Step 2: Nucleophilic attack of water on carbocation. 	½
	Step 3: Deprotonation to form an alcohol. 	½
35. a)		
	b) i) $K_2Cr_2O_7 + H_2SO_4$ / $Na_2Cr_2O_7 + H_2SO_4$	1
	ii) Br_2 in CH_3COOH	1
	iii) Br_2 aq. / Bromine water	1
36.	(a) $E^0cell = E^o_C - E^o_A$ $= 0.34 - (-0.76)$ $= 1.10V$	½ ½
	$\Delta G^o = -nFE^o$ $= -2 \times 1.10 \times 96500$ $= -212300$ J/mol Or -212.3 kJ/mol	½ ½ 1
	(b) (i) Pollution free (ii) High efficiency.	1 1
	OR	

36.	(a)(i) Silver wire at 30^oC because as temperature decreases, resistance decreases so conduction increases. (ii) 0.1 M CH_3COOH, because on dilution degree of ionization increases hence conduction increases. (iii) KCl solution at 50^oC, because at high temperature mobility of ions increases and hence conductance increases (b)	1 1 1
	Electrochemical / **Electrolytic** (1) Anode -ve, Cathode +ve / Anode +ve, Cathode -ve (2) Convert chemical energy to electrical energy / Convert electrical energy to chemical energy (or any other correct differences)	1 1
37.	(a) (i) $Cu^{+1}(3d^{10})$ compounds are white because of absence of unpaired electrons while Cu^{+2} $(3d^9)$ compounds are coloured due to unpaired e^- / shows d-d transition. (ii) Chromate (CrO_4^{2-})changes to dichromate $(Cr_2O_7^{2-})$ ion in acidic medium. (iii) due to completely filled d-orbitals in their ground state or in oxidized state. (b) Co = $[Ar]4s^2 3d^7$, Co^{+2} =$[Ar]\ 3d^7$ $\mu = \sqrt{n(n+2)}$ $= \sqrt{3(3+2)} = \sqrt{15} = 3.92\ B.M.$	1 1 1 ½ + ½ ½ ½
	OR	
37.	(a) **Lanthanoids** / **Actinoids** (1) most of them are not radioactive / All are radioactive (2) don't show a wide range of oxidation state / Show a wide range of oxidation states (3) Most of their ions are colourless / Most of their ions are coloured (or any other correct differences)	1x3
	(b) (i) Sc^{+3} is diamagnetic because of absence of unpaired electron. (ii) Cr has high M.P. & B.P. because of presence of strong intermetallic bonding than Cu.	1 1

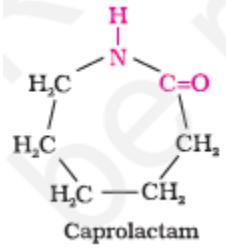
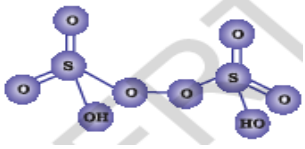
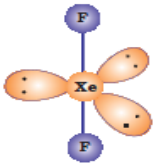
56/1/3

MARKING SCHEME

SR. SECONDARY SCHOOL EXAMINATION, 2020

Subject: CHEMISTRY

Q.No.	Expected Answer / Value Points	Distribution of Marks
	SECTION - A	
1.	Racemic Mixture	1
2.	Monochromatic Light vibrating in one plane.	1
3.	$C_2H_5I + C_6H_5OH$	1
4.	Pent-2-ene / $CH_3CH=CHCH_2CH_3$	1
5.	Antiseptic	1
6.	B	1
7.	Branched hydrocarbon part	1
8.	$CF_2=CF_2$	1
9.	Zn	1
10.	No	1
11.	A	1
12.	C	1
13.	B	1
14.	A	1
15.	C	1
16.	i	1
17.	i	1
18.	iii	1
19.	ii	1
20.	i	1
	SECTION – B	
21.	$\pi = CRT$ (volume of Solution = 100 mL) $\pi = \frac{n}{V} RT$ $\pi = \frac{5}{60} \times \frac{0.0821 \times 300}{0.1}$ π = 20.5 atm. (½ mark may be deducted for no or incorrect unit)	½ ½ 1
21.	**OR** ΔT_f (urea) = ΔT_f (Z) $kf \times \frac{w\ urea}{Murea} \times \frac{1000}{w\ solvent} = kf \times \frac{wz}{Mz} \times \frac{1000}{Wsolvent}$ $\frac{7.5}{60} \times \frac{1000}{100} = \frac{42.75}{Mz} \times \frac{1000}{100}$ $Mz = \frac{42.75 \times 60}{7.50} = 342\ g/mol$ (OR any other correct method) (½ mark may be deducted for no or incorrect unit)	½ ½ 1
22.	(a) 1st order (b) No, due to exponential relation / the curve never touches the x-axis.	1 ½ + ½

23.	(a) The drugs which are used to control stress / anxiety / tension / mild or severe mental diseases (b) The drugs which are used to kill or to prevent the growth of micro-organism, applied externally on living tissues. **OR** Soap molecules form micelle around the oil droplet or dirt in such a way that hydrophobic part interacts with the oil droplet and hydrophilic part projects out. Micelles can be washed away on rinsing with water. Thus soap helps in emulsification and washing away of oil and fats.	1 1 2
24.	(a) CH_2=CH-CH=CH_2 , Butadiene; CH_2=CH–CN , Acrylonitrile (b)  Caprolactam / Aminocaproic acid , $NH_2(CH_2)_5COOH$	½+½ ½+½
25.	(a)  (b)  	1 1
26.	a. $[Co(NH_3)_5(CO_3)]Cl$ b. $K_2[Ni(CN)_4]$	1 1
27.	a. Propane or $CH_3CH_2CH_3$ is formed / $CH_3COCH_3 \xrightarrow{Zn-Hg,\ HCl(conc.)} CH_3CH_2CH_3$ b. Propan-2-ol or Isopropyl alcohol or $(CH_3)_2CHOH$ is formed / $CH_3CHO \xrightarrow[ii)\ H_2O]{i)\ CH_3MgBr} (CH_3)_2CHOH$	1 1

	SECTION – C	
28.	(a) Because sulphur readily gets oxidized itself to more stable +6 state.	1
	(b) Because of absence of d-orbital in Fluorine.	1
	(c) Because size increases from Helium to Radon. / dispersion or van der Waal forces increase from Helium to Radon.	1
	OR	
28.	(a) $MnO_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$	
	(b) $XeF_6 + KF \rightarrow K^+[XeF_7]^-$	1
	(c) $4I^-_{(aq.)} + 4H^+_{(aq.)} + O_{2(g)} \rightarrow 2I_{2(s)} + 2H_2O_{(l)}$	1
		1
29.	$\Delta T_f = K_f \ m$	1
	$1.5 = \frac{3.9 \times w_B}{176} \times \frac{1000}{75}$	1
	Mass of ascorbic acid = 5.08 g.	1
30.	(a) Decreases.	1
	(b) Increases	1
	(c) Increases	1
31.	(a) (A) $\rightarrow CH_3CONH_2$ (B) $\rightarrow CH_3NH_2$	½ + ½
	(b) (A) $\rightarrow C_6H_5NH_2$ (B) $\rightarrow C_6H_5N_2Cl$	½ + ½
	(c) (A) $\rightarrow C_6H_5CN$ (B) $\rightarrow C_6H_5COOH$	½ + ½
	OR	
31	a) (i) 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.	1
	ii) Add $CHCl_3$ and KOH (alc.) to both the compounds. Aniline gives foul smelling isocyanides while N-Methylaniline doesn't. (Or any other suitable chemical test)	1
	b) Butanol > Butanmine > Butane	1
32.	(a) Because the – CHO group in glucose is involved in hemiacetal formation and thus is not free / due to cyclic structure of glucose -CHO group is not free.	1
	(b) Because the hydrogen bonds are formed between specific pairs of bases.	1
	(c) Starch is a polymer of α - glucose while cellulose is a polymer of β - glucose.	1
33.	(a) It selectively prevents one of the sulphide ore from coming to the froth.	1
	(b) Helps in converting Zr into its volatile compound ZrI_4.	1
	(c) Provides flux to remove impurities.	1

34.

Physiorption	Chemisorption	
(i) Weak van der Waal forces	Strong chemical bonds	1
(ii) Favourable at low temperature	Increases till a certain temperature and then decreases afterwards.	1
(iii) low $\Delta H_{adsorption}$	High $\Delta H_{adsorption}$	1

SECTION – D

35. (a) (i) $Cu^{+1}(3d^{10})$ compounds are white because of absence of unpaired electrons while Cu^{+2} $(3d^9)$ compounds are coloured due to unpaired e^- / shows d-d transition. — 1

(ii) chromate (CrO_4^{2-})changes to dichromate $(Cr_2O_7^{2-})$ ion in acidic medium. — 1

(iii)due to completely filled d-orbitals in their ground state or in oxidized state. — 1

(b) Co = $[Ar]4s^2 3d^7$, Co^{+2} =$[Ar]\ 3d^7$ — ½ + ½

$\mu = \sqrt{n(n+2)}$ — ½

$= \sqrt{3(3+2)} = \sqrt{15} = 3.92\ B.M.$ — ½

OR

35. (a)

Lanthanoids	Actinoids	
(1) most of them are not radioactive	All are radioactive	1x3
(2) don't show a wide range of oxidation state	Show a wide range of oxidation states	
(3) Most of their ions are colourless	Most of their ions are coloured	

(or any other correct differences)

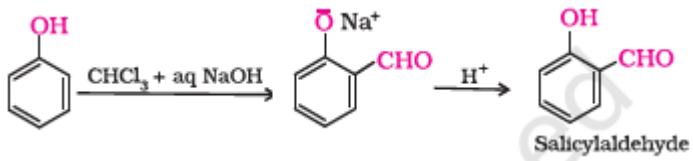
(b) (i) Sc^{+3}, because of absence of unpaired electron. — ½ +½

(ii) Cr, because of presence of stronger intermetallic bonding than Cu. — ½ +½

36. (a) Tert-butyl alcohol, — 1

because it forms more stable 3^o carbocation than 1^o carbocation. — 1

b) i)

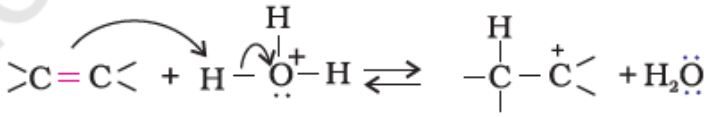
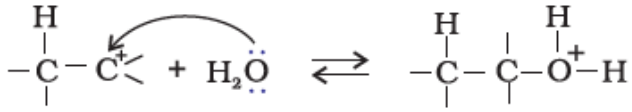
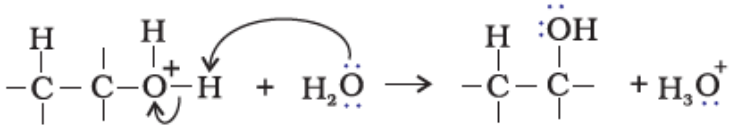


— 1

ii) $(CH_3)_3CCl + NaOH_{(aq.)} \rightarrow (CH_3)_3COH \xrightarrow{Na} (CH_3)_3CONa$

$(CH_3)_3CONa \xrightarrow{C_2H_5Cl} (CH_3)_3COC_2H_5$

— 1

	iii) $CH_3CH{=}CH_2 \xrightarrow[vi)\ H_2O_2/OH^-]{v)\ B_2H_6} CH_3CH_2CH_2OH$	1
	(or by any other suitable method)	
	OR	
36. a)	Step 1: Protonation of alkene to form carbocation by electrophilic attack of H_3O^+.	
	$H_2O + H^+ \rightarrow H_3O^+$	
		1
	Step 2: Nucleophilic attack of water on carbocation.	
		½
	Step 3: Deprotonation to form an alcohol.	
		½
	b) i) $K_2Cr_2O_7 + H_2SO_4$ / $Na_2Cr_2O_7 + H_2SO_4$	1
	ii) Br_2 in CH_3COOH	1
	iii) Br_2 aq. / Bromine water	1
37.	(a) $E^0cell = E^o_C - E^o_A$	½
	$= 0.34 - (-0.76)$	
	$= 1.10V$	½
	$\Delta G^o = -nFE^o$	½
	$= -2 \times 1.10 \times 96500$	½
	$= -212300$ J/mol Or -212.3 kJ/mol	1
		1
	(b) (i) Pollution free	1
	(ii) High efficiency.	
	OR	
37.	(a) (i) Silver wire at 30^oC because as temperature increases, resistance increases so conduction decreases.	1
	(ii) 0.1 M CH_3COOH, because on dilution degree of ionization increases hence conduction increases.	1
	(iii) KCl solution at 50^oC, because at high temperature mobility of ions increases and hence conductance increases	1
	(b)	

Electrochemical	Electrolytic	
(1) Anode -ve Cathode +ve	Anode +ve Cathode -ve	1
(2) Convert chemical Energy to electrical energy	Convert electrical Energy to chemical energy	1

(or any other correct differences)