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# Senior School Certificate Examination
# 2018
# Marking Scheme ------- Chemistry

**General Instructions**

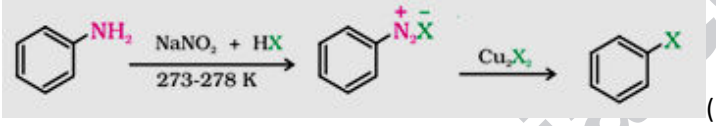
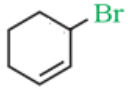
1. The Marking Scheme provides general guidelines to reduce subjectivity in the marking. The answers given in the Marking Scheme are Suggested answers. The content is thus indicative. If a student has given any other answer which is different from the one given in the Marking Scheme, but conveys the same meaning, such answers should be given full weight-age.
2. The Marking Scheme carries only suggested value point for the answers. These are only guidelines and do not constitute the complete answers. The students can have their own expression and if the expression is correct the marks will be awarded accordingly.
3. The Head-Examiners have to go through the first five answer-scripts evaluated by each evaluator to ensure that the evaluation has been carried out as per the instruction given in the marking scheme. The remaining answer scripts meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
4. 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.
5. If a question has parts, please award marks in 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 circled.
6. If a question does not have any parts, marks be awarded in the left-hand margin.
7. If a candidate has attempted an extra question, marks obtained in the question attempted first should be retained and the other answer should be 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. Separate marking schemes for all the three sets have been provided.
11. As per orders of the Hon'ble Supreme Court. The candidate would now be permitted to obtain photocopy of the Answer Book on request on payment of the prescribed fee. All examiner/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.
12. The Examiners should acquaint themselves with the guidelines given in the Guidelines for sport Evaluation before starting the actual evaluation.
13. Every Examiner should stay upto sufficiently reasonable time normally 5-6 hours every day and evaluate 20-25 answer books and should minimum 15-20 minutes to evaluate each answer book.
14. Every Examiner should acquaint himself/herself with the marking schemes of all the sets.

# Marking scheme – 2017-18

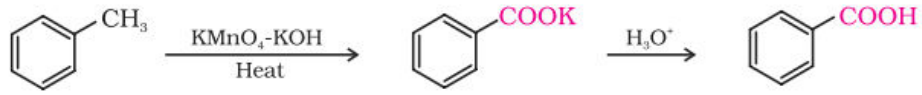
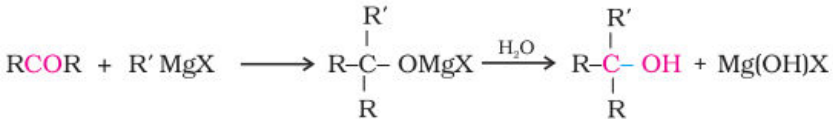
## CHEMISTRY (043)/ CLASS XII (Compartment Exam)

## 56(B)

| Q.No | Value Points | Marks |
|---|---|---|
| 1 | Due to its tendency to flow. | 1 |
| 2 | Dispersed phase : Water , Dispersion medium : Air | 1 |
| 3 | Because it reacts readily with water to give hydrocarbon. | 1 |
| 4 | $[Pt(NH_3)_3Cl]Cl$ | 1 |
| 5 | A : $CH_3CH(OH)CN$ , B: $CH_3CH(OH)COOH$ | ½ , ½ |
| 6 | a) Zinc being more reactive and will sacrifies for sake of iron.<br>b) No. of ions per unit volume decreases. | 1<br>1 |
| | OR | |
| 6 | The conductivity of a solution at any given concentration is the conductance of one unit volume of solution kept between two platinum electrodes with unit area of cross section and at a distance of unit length.<br>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. | 1<br>1 |
| 7 | a) Rate constant is defined as the rate when the concentration terms are unity.<br>b) Activation energy is the minimum energy required to form an activated complex which may or may not be converted to products. | 1<br>1 |
| 8 | a) 3<br>b) $sp^3$ | 1<br>1 |
| 9 | a) Because it undergoes disproportionation reaction.<br>b) Because $Cr^{3+}$ has stable $t_{2g}^3$ configuration. | 1<br>1 |
| 10. | a) $C_6H_5OH \xrightarrow{Zn\ dust,\ heat} C_6H_6 \xrightarrow{CH_3Cl,\ Anhyd.AlCl_3} C_6H_5CH_3$<br>b) $RCOR + R'MgX \longrightarrow R-\underset{R}{\overset{R'}{C}}-OMgX \xrightarrow{H_2O} R-\underset{R}{\overset{R'}{C}}-OH + Mg(OH)X$ (R and R'= $CH_3$) | 1<br>1 |
| 11 | Mass of $2 \times 10^{24}$ atoms = 300g<br>Mass of $6.022 \times 10^{23}$ atoms = $\frac{300 \times 6.022 \times 10^{23}}{2 \times 10^{24}}$ = 90.3 g<br>$d=\frac{zM}{a^3\ Na} = \frac{4 \times 90.3}{(250 \times 10^{-10})^3 \times 6.022 \times 10^{23}}$<br>$d=38.4\ g/cm^3$ | 1<br>½ , ½<br>1 |
| 12 | $E_{cell} = E^o_{cell} - \frac{0.0591}{n} \log \frac{[Mg2+]}{[Cu2+]}$<br>$=2.71V - \frac{0.0591}{2} \log \frac{[0.1]}{[0.01]}$<br>$= 2.71\ V - 0.0295 \times 1 = 2.68\ V$ | 1<br>1<br>1 |
| | OR | |
| 12 | Cell constant , G* = conductivity × resistance<br>$= 1.29 \times 10^{-2}\ Scm^{-1} \times 100\ ohm = 1.29\ cm^{-1}$<br>Conductivity of 0.02 $mol.L^{-1}$ KCl $= \frac{G*}{Resistance} = \frac{1.29\ cm-1}{520\ ohm} = 0.00248\ S\ cm^{-1}$<br>$\Lambda m = \frac{k \times 1000}{conc} = \frac{2.48 \times 10^{-3} \times 1000}{0.02} = 124\ S\ cm^2\ mol^{-1}$ | 1<br>1<br>1 |
| 13 | $k=\frac{2.303}{t} \log \frac{[A]_0}{[A]}$ | |

| | | |
|---|---|---|
| | $k=\frac{2.303}{40}\log\frac{100}{70}$ | 1 |
| | $k=\frac{2.303}{40}\times 0.1549 = 0.0089\ min^{-1}$ | 1 |
| | $t_{½}=\frac{0.693}{k}=\frac{0.693}{0.0089}=77.86\ min$ | 1 |
| 14 | a) The process of settling of colloidal particles forming precipitate.<br>b) The process in which reactants and catalyst are in different phase.<br>c) It is the potential difference between the fixed layer and the diffused / double layer of opposite charges around the colloidal particles. | 1<br>1<br>1 |
| 15 | a) Zone refining ; It is based on the principle that the impurities are more soluble in the melt than in the solid state of the metal.<br>b) Because iron oxide present in copper ore as impurity reacts with silica forming slag | 1,1<br>1 |
| 16 | a) It is due to small size , high ionic charge and availability of d-orbitals.<br>b) Because of lanthanoid contraction.<br>c) $3d^5$ of $Mn^{2+}$ is more stable than $3d^6$ of $Fe^{2+}$ | 1<br>1<br>1 |
| 17 | a) 5<br>b) Pentaamminenitrito-O-cobalt(III) chloride<br>c) $dsp^2$ , square planar | 1<br>1<br>½ , ½ |
| 18 | a)  ( where X= Br)<br>b)  <br>c) 4-chloropent-1-ene | 1<br>1<br>1 |
| 19. | A : $CH_3COOH$ , B: $CH_3COCl$<br>C: $CH_3CHO$ , D: $CH_3CH_2OH$ | 1, ½<br>1, ½ |
| 20. | a) Due to oxidation<br>b) Due to combined effects of solvation , +I and steric effects<br>c) In aniline ,due to resonance(+R effect) lone pair of electrons on nitrogen is not readily available for protonation and hence weaker base than cyclohexylamine. | 1<br>1<br>1 |
| 21 | a) Vinyl chloride<br>b) Hexamethylene diamine and adipic acid<br>c) Ethylene glycol and terepthalic acid (Structures of monomers are also accepted) | 1<br>1<br>1 |
| 22 | a) Tranquilizers are a class of chemical compounds used for the treatment of stress, and mild or even severe mental diseases.<br>b) Antiseptics are the chemicals which either kill or prevent the growth of microorganisms when applied on living tissues.<br>c) Chemical compounds used for treatment of acidity of the stomach | 1<br>1<br>1 |
| 23 | a) Responsive, helpful, kindness (any two)<br>b) Insulin<br>c) Vitamin D ; Rickets | ½ + ½<br>1<br>1,1 |
| 24 | a) Case I : $\frac{p_A^0-p_A}{p_A^0}=\frac{w_B/M_B}{w_A/M_A}$<br>$\frac{p_A^0-2.8}{p_A^0}=\frac{30/M_B}{90/18}=\frac{6}{M_B}$ | ½ |

| | | |
|---|---|---|
| | $\frac{p_A^0 - 2.8}{p_A^0} = \frac{6}{M_B}$ .....(1) | ½ |
| | Case II : $\frac{p_A^0 - 2.9}{p_A^0} = \frac{30/M_B}{108/18} = \frac{5}{M_B}$ | |
| | $\frac{p_A^0 - 2.9}{p_A^0} = \frac{5}{M_B}$ .....(2) | ½ |
| | Divide equation (1) by (2) | |
| | $\frac{p_A^0 - 2.8}{p_A^0 - 2.9} = \frac{6}{5}$ | ½ |
| | $p_A^0 = 3.4$ kPa | |
| | Substituting the value of $p_A^0$ in equation (1) | |
| | $\frac{3.4 - 2.8}{3.4} = \frac{6}{M_B}$ | 1 |
| | $M_B = 34$ g/mol | |
| | (or any other suitable method) | |
| | b) i)Solubilty of gases decrease with increase in temperature, less oxygen is available in summer in lakes but cold waters contains more oxygen. | 1 |
| | ii)Because of increase in intermolecular attractions between A---B in comparison to A—A or B---B interactions. | 1 |
| | OR | |
| 24 | a) $\Delta T_b = K_b.m = \frac{k_b \times w_B \times 1000}{M_B \times w_A}$ | 1 |
| | $M_B = \frac{k_b \times w_B \times 1000}{\Delta T_b \times w_A} = \frac{2.52 \times 1.5 \times 1000}{(353.93 - 353.23) \times 90}$ | 1 |
| | $M_B = 60.0$ g/mol | 1 |
| | b) Due to osmosis. An increase in temperature accelerates the process of osmosis. | 1,1 |
| 25 | a) i)Due to lower bond dissociation enthalpy of Te-H than S-H bond. | 1 |
| | ii)In +5 state it has small size and high polarisation power. | 1 |
| | iii)$H_3PO_2$ has P-H bond due to which it acts as reducing agent. | 1 |
| | b) .  | 1,1 |
| | OR | |
| 25 | a) i) $PCl_5 \xrightarrow{\text{Heat}} PCl_3 + Cl_2$ | 1 |
| | ii) $6\ NaOH + 3Cl_2 \rightarrow 5NaCl + NaClO_3 + 3H_2O$ (hot and conc.) | 1 |
| | iii) $Ca_3P_2 + 6H_2O \rightarrow 3Ca(OH)_2 + 2PH_3$ | 1 |
| | b) .  | 1,1 |

| | | |
|---|---|---|
| 26 | a)i)$CH_3COCH_3 \xrightarrow{Zn\text{-}Hg/HCl} CH_3CH_2CH_3$<br>ii)<br>  <br><br>iii)<br>  <br><br>(R and R'= $CH_3$)<br>d) i)Add ammonical solution of silver nitrate to both the compounds and heat, HCOOH will give silver mirror.<br>ii)Add neutral $FeCl_3$ solution to both the compounds, phenol gives violet complex.<br>(or any other suitable test) | 1<br><br>1<br><br><br><br>1<br><br>1<br><br>1 |
| | OR | |
| 26 | a)i)Because carboxyl group gets bonded to the catalyst anhydrous $AlCl_3$<br>ii)Because $–NH_2$ group closer to carbonyl group is involved in resonance.<br>iii)Sodium bisulphite reacts with carbonyl compound to give crystalline addition product.So these products are easily isolated in pure state from non-carbonyl compounds.<br>b)i) A : $CH_3COOH$ , B: $ClCH_2COOH$<br>ii) A : $C_6H_5COONa$ , B : $C_6H_6$ | 1<br>1<br><br>1<br>½ + ½<br>½ + ½ |