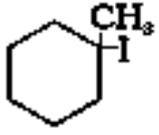
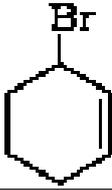
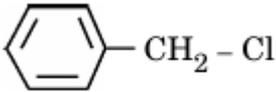
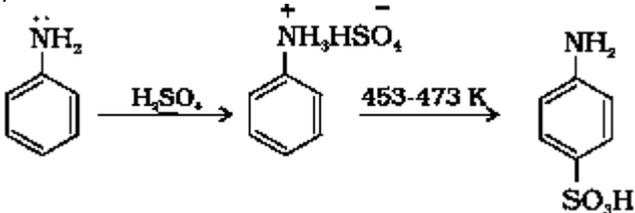
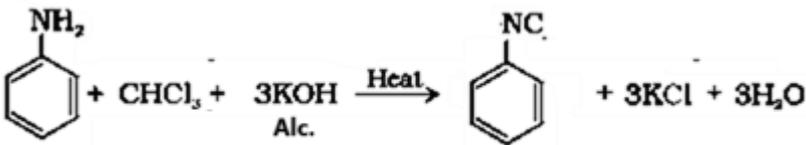
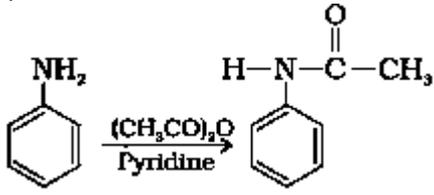
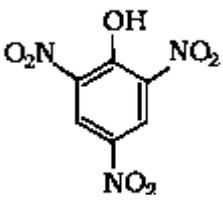
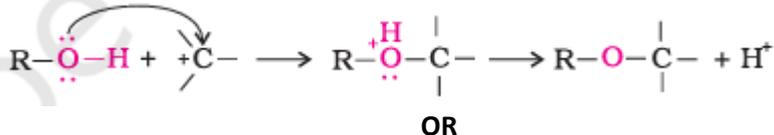
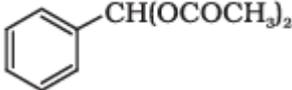
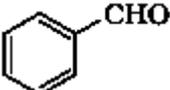
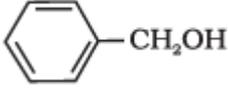


Q.No	Value points	Mark
	<b>SECTION A</b>	
1	B	1
2	D	1
3	A	1
4	C	1
5	A	1
6	C	1
7	B	1
8	A	1
9	C	1
10	B	1
11	C	1
12	B	1
13	B	1
14	A	1
15	D	1
16	A	1
	<b>SECTION B</b>	
17	<ul style="list-style-type: none"> <li>At a constant temperature, the solubility of a gas in a liquid is directly proportional to the partial pressure of the gas present above the surface of liquid or solution/ the partial pressure of the gas in vapour phase (<math>p</math>) is proportional to the mole fraction of the gas (<math>x</math>) in the solution</li> <li>Because the solubility of oxygen increases with decrease in temperature/ Because of low solubility of <math>O_2</math> in warm water.</li> </ul>	1 1
18	a) First order b) Slope= $k/ 2.303$	1 1
19	a) i) Dichloridobis(ethane-1,2-diamine)cobalt(IV) sulphate ii) Potassium trioxalatoferrate(III)	1 1
	<b>OR</b>	
19	b) i) Double salts dissociate into simple ions while complex compounds do not dissociate completely into ions when dissolved in water. (Or any other suitable difference) ii) When a ligand binds through two donor atoms is called a didentate ligand while a unidentate ligand which has two different donor atoms and either of the two ligates in the complex is called ambidentate ligand.	1 1
20	a)  b) 	1 1



	Order w.r.t B = 0 From eq 1 $5 \cdot 0 \times 10^{-3} = k [0.01]^1 [0.01]^0$ $k = 0.5 \text{ min}^{-1}$	$\frac{1}{2}$ $\frac{1}{2}$																								
24	a) Because of the formation of NaOH / Due to the formation of OH <sup>-</sup> ions. b) Because the overall reaction does not involve any ion in solution whose concentration can change during its life time. c) Because the number of ions per unit volume that carry current in a solution decreases.	1 1 1																								
25	a) [FeF <sub>6</sub> ] <sup>3-</sup> - sp <sup>3</sup> d <sup>2</sup> [Fe(CN) <sub>6</sub> ] <sup>4-</sup> - d <sup>2</sup> sp <sup>3</sup> b) [FeF <sub>6</sub> ] <sup>3-</sup> - outer orbital complex [Fe(CN) <sub>6</sub> ] <sup>4-</sup> - inner orbital complex c) [FeF <sub>6</sub> ] <sup>3-</sup> - paramagnetic [Fe(CN) <sub>6</sub> ] <sup>4-</sup> - diamagnetic	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$																								
<b>OR</b>																										
25	a) It becomes colourless/ colour slowly fades away b) t <sub>2g</sub> <sup>3</sup> e <sub>g</sub> <sup>2</sup> c) sp <sup>3</sup> , diamagnetic	1 1 $\frac{1}{2} + \frac{1}{2}$																								
26.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">S<sub>N</sub>1</th> <th style="text-align: center;">S<sub>N</sub>2</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Unimolecular</td> <td>Bimolecular</td> </tr> <tr> <td>2</td> <td>It follows first order kinetics</td> <td>It follows second order kinetics</td> </tr> <tr> <td>3</td> <td>Retention of configuration</td> <td>Inversion of configuration</td> </tr> <tr> <td>4.</td> <td>Racemisation occurs</td> <td>No racemisation is seen</td> </tr> <tr> <td>5.</td> <td>Takes place through formation of carbocation</td> <td>Takes place through formation of transition state</td> </tr> <tr> <td>6.</td> <td>Occurs in polar protic solvent</td> <td>Occurs in polar aprotic solvent</td> </tr> <tr> <td>7.</td> <td>Rate is independent of the concentration of the nucleophile.</td> <td>Rate is dependent on the concentration of the nucleophile.</td> </tr> </tbody> </table> <p style="text-align: right;"><b>(Any TWO )</b></p> <div style="text-align: center;">  <p>, because of the stability of benzyl carbocation</p> </div>		S <sub>N</sub> 1	S <sub>N</sub> 2	1	Unimolecular	Bimolecular	2	It follows first order kinetics	It follows second order kinetics	3	Retention of configuration	Inversion of configuration	4.	Racemisation occurs	No racemisation is seen	5.	Takes place through formation of carbocation	Takes place through formation of transition state	6.	Occurs in polar protic solvent	Occurs in polar aprotic solvent	7.	Rate is independent of the concentration of the nucleophile.	Rate is dependent on the concentration of the nucleophile.	1+1 $\frac{1}{2} + \frac{1}{2}$
	S <sub>N</sub> 1	S <sub>N</sub> 2																								
1	Unimolecular	Bimolecular																								
2	It follows first order kinetics	It follows second order kinetics																								
3	Retention of configuration	Inversion of configuration																								
4.	Racemisation occurs	No racemisation is seen																								
5.	Takes place through formation of carbocation	Takes place through formation of transition state																								
6.	Occurs in polar protic solvent	Occurs in polar aprotic solvent																								
7.	Rate is independent of the concentration of the nucleophile.	Rate is dependent on the concentration of the nucleophile.																								
27	A = CH <sub>3</sub> CH=CHCN / But-2-ene nitrile B = CH <sub>3</sub> CH=CHCHO / But-2-enal $\text{CH}_3\text{CH}=\text{CHCN} \xrightarrow[2. \text{H}_2\text{O}]{1. \text{DIBAL-H}} \text{CH}_3\text{CH}=\text{CHCHO}$	1 1 1																								
28	a) <div style="text-align: center;">  </div> b) <div style="text-align: center;">  </div>	1 X 3																								

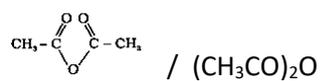
	c) <div style="text-align: center;">  </div>	
<b>SECTION D</b>		
29	<p>a) i)</p> <div style="text-align: center;">  </div> <p style="text-align: center;">/ 2,4,6-Tribromophenol is formed</p> <p>ii)</p> <div style="text-align: center;">  </div> <p style="text-align: center;">/ 2,4,6-Trinitrophenol / Picric acid is formed.</p> <p>b) (i)</p> <div style="text-align: center;">  <p style="text-align: center;"><b>OR</b></p> </div> <p>b)(ii) due to <math>sp^2</math> hybridisation leading to shorter bond length / Due to resonance leading to partial double bond character of C-OH bond</p> <p>c) 2-Methylpropan-2-ol gives turbidity immediately whereas butan-1-ol does not react.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>
30	<p>a) (i) A linkage which joins amino acids through -CO-NH- bond</p> <p>(ii) When a protein in its native form, is subjected to physical change like change in temperature or chemical change like change in pH, it loses its biological activity.</p> <p>b) Due to zwitter ion formation which can react with both acids and bases./ Due to the presence of both carboxylic group and amino group.</p> <p>c) (i) Fibrous protein: parallel polypeptide chain structure / insoluble in water          Globular protein: spherical polypeptide chain structure/ soluble in water</p> <p style="text-align: right;"><b>(Any one difference)</b></p> <p style="text-align: center;"><b>OR</b></p> <p>c) (ii) <math>\alpha</math>-helix and <math>\beta</math>-pleated sheet</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p><b>(Any one difference)</b></p> <p><b>OR</b></p> <p><math>\frac{1}{2} + \frac{1}{2}</math></p>
<b>SECTION E</b>		
31	<p>(a) (i)</p> $E_{\text{Cell}} = (E^{\circ}_c - E^{\circ}_a) - \frac{0.059}{2} \log \left[ \frac{Zn^{2+}}{Pb^{2+}} \right]$ $= [(-0.13) - (-0.76)] - \frac{0.059}{2} \log \frac{0.1}{0.02}$ $= 0.63 - 0.0295 \log 5$ $= 0.63 - 0.0295 \times 0.699$ $= 0.63 - 0.02$ $= 0.61V$ <p style="text-align: right;">(Deduct <math>\frac{1}{2}</math> mark for no or incorrect unit)</p>	<p>1</p> <p>1</p> <p>1</p>

	(ii) The amount of chemical reaction which occurs at any electrode during electrolysis by a current is proportional to the quantity of electricity passed through the electrolyte. 5F	1 1
<b>OR</b>		
31	(b) (i) $k = G^*/R$ $G^* = k \times R = 0.125 \times 10^{-3} \times 1000$ $= 0.125 \text{ cm}^{-1}$ (ii) $E_{\text{Mg}^{2+}/\text{Mg}} = E^0_{\text{Mg}^{2+}/\text{Mg}} - \frac{0.059}{2} \log \frac{1}{[\text{Mg}^{2+}]}$ $= 2.36 \text{ V} - \frac{0.059}{2} \log \frac{1}{10^{-4}}$ $= 2.36 - 0.0295 \times 4 \log 10$ $= 2.242 \text{ V}$ (iii) It decreases with increase in temperature	$\frac{1}{2}$ 1 $\frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$ 1
32	(a) (i) (I) Due to formation of chromate / $\text{CrO}_4^{2-}$ ion (II) Due to completely filled d-orbitals in ground state as well as oxidised state. (III) Because $\text{Mn}^{2+}$ is more stable due to stable $3d^5$ configuration whereas $\text{Cr}^{3+}$ is more stable due to stable $t_{2g}^3$ configuration.  (ii) (I) it changes to permanaganate ion / $\text{MnO}_4^-$ is formed / $3\text{MnO}_4^{2-} + 4\text{H}^+ \rightarrow 2\text{MnO}_4^- + \text{MnO}_2 + 2\text{H}_2\text{O}$ (II) Potassium manganate/ $\text{K}_2\text{MnO}_4$ is formed / $2\text{KMnO}_4 \rightarrow \text{K}_2\text{MnO}_4 + \text{MnO}_2 + \text{O}_2$	1 1 1    1  1
<b>OR</b>		
32.	(b) i) <ul style="list-style-type: none"> <li>An alloy of lanthanoid / an alloy of lanthanoid and iron with traces of S, C, Ca and Al.</li> <li>used in making bullets/shells/ lighter flint</li> </ul> ii) $\text{CrO}_4^{2-}$ / $\text{Cr}_2\text{O}_7^{2-}$ iii) variable oxidation state of vanadium / large surface area /Complex formation iv) Because of large number of unpaired electrons in their atoms they have stronger interatomic interaction or strong metallic bonding v) by acidification of $\text{Na}_2\text{CrO}_4$ / $2\text{Na}_2\text{CrO}_4 + 2 \text{H}^+ \rightarrow \text{Na}_2\text{Cr}_2\text{O}_7 + 2 \text{Na}^+ + \text{H}_2\text{O}$	$\frac{1}{2} + \frac{1}{2}$ 1 1 1 1
33	(a) (i)  A=  B=  C= (ii) (I) Because carbon of carboxyl group is less electrophilic due to resonance with -OH group. (II) Because ethanoate ion is more stable than ethoxide ion due to resonance.	1  1  1  1 1

33

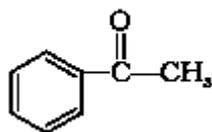
(b) i)

(I)



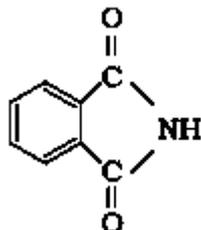
1

(II)



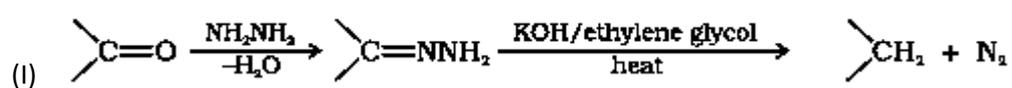
1

(III)



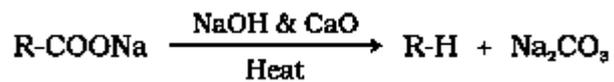
1

(ii)



1

(i)



1

(ii)