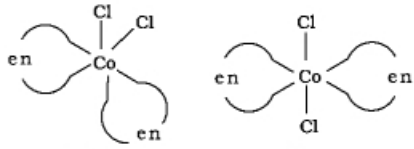
Qn No.	Sub. Qn	Value Points / Scoring Indicators	Split score	Total Score
1		Benzene + Toluene or (d)		1
2		(d) or Calamine		1
3		Magnetic moment, $\mu = \sqrt{n(n+2)}$ n –No. of unpaired e-		1
4		Ethylenediaminetetraacetate ion or $EDTA^{4-}$.		1
5		2 – Acetoxy benzoic acid (OR) Acetyl salicylic acid		1
6		ZSM -5		1
7		Chloroxylenol and terpineol		1
8		**Crystalline Solids** / **Amorphous solids.** • Definite shape / Irregular shape • Sharp melting point / Melts over a range of temp. • Shows cleavage property. / Deosnot show cleavage Property • Anisotropic / Isotropic • True solids / Pseudo solid or super Cooled liquids. • Long range order / Short range order (Any Two is sufficient)		2
9		Since X atom are at corners, No.of atom = $1/8 \times 8 = 1$	1	2
		Since Y atoms are at body centre No. of atom = 1		
		∴ Formulae of the compound is **XY**	1	
10		On Coupling Zn electrode with SHE it forms a cell with Zn as anode (Zn/Zn^{2+}) and SHE as Cathode. (Zn has a greater Tendency to ionize than H_2 does) Thus we can write ;	1	2
		$E^{o}_{Cell} = E^{o}_{Cathode} - E^{o}_{Anode}$ $0.76 = 0 - E^{o}_{Anode}$ (Electrode potential of SHE = 0) $E^{o}_{Anode} = 0 - 0.76 =$ **-0.76**	1	

11		$Al^{3+} + 3e^- \longrightarrow Al$ 27g Ie, 27g Al needs = 3 F 1g Al needs = $\frac{3}{27}$ F 40g Al needs = $\frac{3}{27} \times 40$ F $= \frac{1}{9} \times 40$ F = (1/9)×40×96500 C $= 4.3 \times 10^5$ C. **(Can Also use Mole concept)**	**1** **1**	**2**
12		Branch of chemistry which deals with the study of Reaction rate and their mechanism are called Chemical Kinetics. It helps to determine rate of a reaction and the conditions By which reaction rates can be altered.	**1** **1**	**2**
13		When catalyst and reactants are in same phase it is said to Be homogenous catalysis. Eg: i) Oxidation of SO_2 to SO_3 in contact process. ii) Hydrolysis of methyl acetate catalyzed by H^+ ion. iii) Hydrolysis of sugar catalyzed by H^+ ions. (Any one example or reaction)	**1** **1**	**2**
14		Nickel is heated with CO forming volatile Nickel carbonyl Which on subjected to high temperature, decomposes to Give pure metal $Ni + 4CO \rightarrow Ni(CO)_4$ [330 – 350 K] $Ni(CO)_4 \rightarrow Ni + 4CO$ [450 – 470 K]	**1** **1**	**2**
15		Due to comparatively higher electronegativity of Nitrogen Than phosphorous, intermolecular H – bonding is Possible in NH_3 but not in PH_3		**2**
16		Transition elements are those elements which has Incomplete d orbitals either in ground or in any oxidized	**1**	

		state. For Ag, Ag^{2+} has $4d^9$ Configuration, thus silver is a transition metal.	1	2
17		The 5f electrons of actinoids are more effectively shielded fr nuclear Charge than 4f in lanthanoids.		2
18				
19	(a)	Diisobutylaluminium hydride (DIBAL – H) is used to selectively reduce nitriles and some esters without affecting double or triple bond in it.	1	2
	(b)		1	
20		Gas phase : $(CH_3)_3N > (CH_3)_2NH > CH_3NH_2$ Aqueous solution : $(CH_3)_2NH > CH_3NH_2 > (CH_3)_3N$	1 1	2
21		• To increase the solubility of CO_2 in water, soda water Is kept under high pressure in sealed vessels. • Formation of bends as the scuba divers reach the Surface of the sea. • At high altitude partial pressure of oxygen is less and Lead to low conc. Of same in blood. This condition is Called as Anoxia.	1 1 1	3
22		**<u>Activity of a catalyst.</u>** It is the ability of a catalyst to speed up a chemical Reaction. It depends upon strength of chemisorption. Eg: For hydrogenation reaction, catalytic activity Increases from group 5 to group 11. **<u>Selectivity of a catalyst</u>** Ability of a catalyst to direct a chemical reaction to yield a Particular product. Eg:	1 ½ 1 ½	3

(i) $CO(g) + 3H_2(g) \xrightarrow{Ni} CH_4(g) + H_2O(g)$

(ii) $CO(g) + 2H_2(g) \xrightarrow{Cu/ZnO\text{-}Cr_2O_3} CH_3OH(g)$

(iii) $CO(g) + H_2(g) \xrightarrow{Cu} HCHO(g)$

23 (a) i) $[Co(NH_3)_4(H_2O)Cl]Cl_2$ — 1

ii) $K_2[Zn(OH)_4]$ — 1 — 3

(b) Potassium tetrathyocynato cobaltate(III) — 1

24

The SN1 reactions are carried out in polar protic solvents Like water, alcohol etc. The reaction of $(CH_3)_3CBr$ and Nucl OH^- follows first order kinetics, that is rate of The reaction depends only on one reactant ie, t – butyl Bromide. — 1 — 3

Step 1 – Formation of carbo cation. — 1

$(CH_3)_3C\ Br \Leftrightarrow (CH_3)_3C^+ + Br^-$

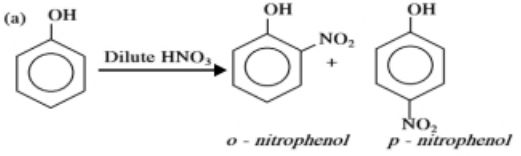
Step 2 – Attack of Nucleophile — 1

$(CH_3)_3C^+ + OH^- \longrightarrow (CH_3)_3C\text{-}OH$

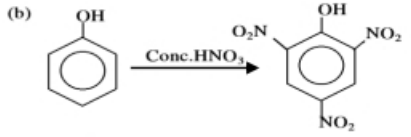
Ie,

$(CH_3)_3CBr + OH^- \longrightarrow (CH_3)_3COH + Br^-$

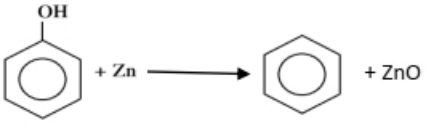
25

(a) 

o - nitrophenol *p - nitrophenol* — 1

(b) 

— 1 — 3



— 1

26

i) Ammonolysis of alkyl halide

$NH_3 + CH_3CH_2Cl \longrightarrow C_2H_5 - NH_3^+Cl^-$

$C_2H_5 - NH_3^+Cl^- + NaOH \longrightarrow C_3H_5NH_2 + H_2O + NaCl$ — 1

ii) Reduction of nitriles

$CH_3\underline{CN} \xrightarrow[Na(Hg)/\ Ethanol]{H_2\ /\ Ni} CH_3\underline{CH_2}\ \underline{NH_2}$ — 1

iii) Reduction of amides

$CH_3\underline{CO}NH_2 \xrightarrow[H_2O]{LiAlH_4} CH_3\underline{CH_2}NH_2$ — 1

iv) Hoffmann bromamide Degradation

$CH_3CH_2CONH_2 + Br_2 + NaOH \longrightarrow CH_3CH_2NH_2 + Na_2CO_3 + 2H_2O + 2NaBr$

3

27

DNA	RNA	
• Contains deoxyribose sugar	Contains Ribose sugar	1
• Nitrogen base are adenine, Thymine,Guanine, Cytosin	Nitrogen bases are adenin Uracil, Guanine, Cytosin	1
• Double stranded	Single stranded	3
• Genetic material in most organisms	Genetic material in some Protein synthesis.	1
• More stable	Less stable	

28

(a) Question is unclear since NCERT text does not mention the Term **synthetic polypeptide**.
May be the questioner asking for polyamides.
- So, Nylon6 and Nylon-6,6. OR any appropriate answer.

(b) Appropriate answer.

3

29

(a) Drugs Used to decrease the acidity od stomach is antacids. — 1

(b) Drugs which abolish pain without impairing consciousness — 1

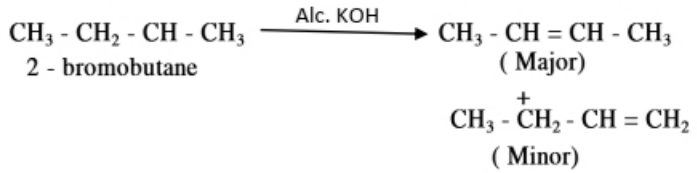
(c) Antibiotics are chemicals which kills or prevent the growth Of microorganism which are in turn prepared from other Microorganisms — 1

3

30	(a)	The reaction which appears to be higher order but actually f first order kinetics are called pseudo first order reactions. It happens when one reactant is in excess. $CH_3COOC_2H_5 + H_2O \rightarrow CH_3COOH + C_2H_5OH$ $r = k'[CH_3COOC_2H_5][H_2O]$ Since $[H_2O]$ is a constant, $r = k\,[CH_3COOC_2H_5]$ where $k = k'[H_2O]$ Thus it follows first order kinetics.	2	
	(b)	$K = 1.15\times10^{-3}\ s^{-1}$ $[R]_0 = 5g$ $[R] = 3g$ $t = ?$ We have for first order reaction, $K = \frac{2.303}{t} \log \frac{[R]_0}{[R]}$ $t = \frac{2.303}{k} \log \frac{[R]_0}{[R]}$ $t = \frac{2.303}{1.15\times10^{-3}} \log \frac{5}{3} = \mathbf{4.442\times10^2\ s}$	1 1	4
31	(a)	Due to the ease with which it liberate atoms of nascent Oxygen, it act as a powerful oxidizing agent. $O_3 \rightarrow O_2 + [O]$	1 1	4
	(b)	When ozone react with an excess of potassium iodide soln Buffered with a borate buffer(pH 9.2) iodine is liberated, Which can be titrated against a standard solution of Sodium thiosulphate	2	
32	(a)	It is because, i) The resonance in chlorobenzene tend to develop a partial double bond character to the C – Cl bond which is difficult to cleave or break. (Or draw resonance structure ii) The C carrying halogen in chlorobenzene is sp^2 hybridi zed which is more electronegative than sp^3 hybridized carbon in alkyl chloride. Thus the bond in chlorobenzene	1 1	

become shorter and difficult to break.

(b)



1

4

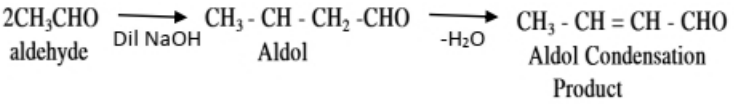
It is because as per saytzeff rule, the product in which Double bonded carbon carries greater number of alkyl Group is formed as major product.

1

33.

(a) Aldehydes having atleast one alpha hydrogen Undergo reaction in presence of dil alkali to form aldols Which readily looses water to give αβ unsaturated Carbonyl compounds.

2



4

(b) HVZ Reaction.
Carboxyllic acids with alpha hydrogen halogenated with Chlorine or bromine in presence of red phosphorous, to Give α halo carboxylic acid.

2