CBSE Class 12 Chemistry Question Paper 2020 Solution Set 2

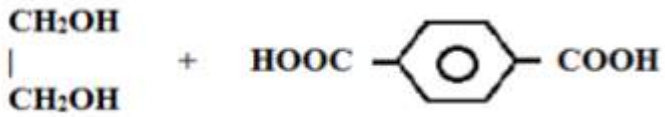
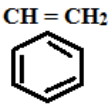
CHEMISTRY STANDARD SOLVED

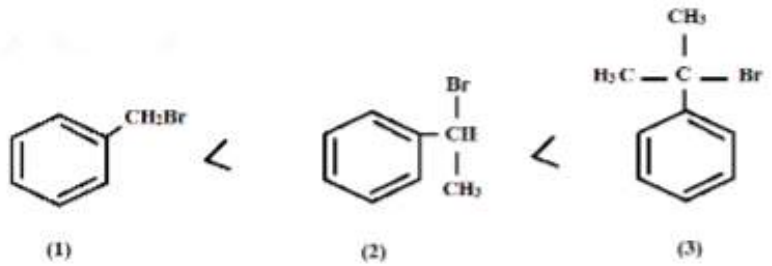
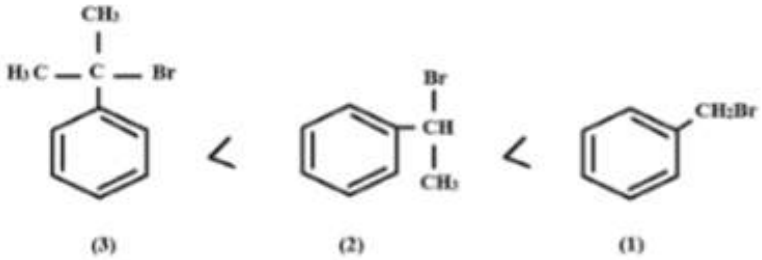
SET 2 (CODE: 30/5/2)

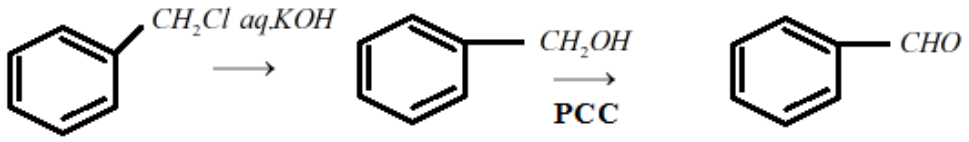
Q. NO	SOLUTION	TOTAL MARKS
	SECTION – A	
1.	Organic compounds with $-NH_2$ and COOH group are known as amino acids	1
2.	Due to the formation of zwitter ion	1
3.	Acidic amino acids have more –COOH groups and basic amino acids have more NH_2 groups	1
4.	These are not synthesized by body to be supplied in diet.	1
5.	Peptide linkage	1
6.	Vapour phase refining.	1
7.	Desorption	1
8.	Zinc	1
9.	Linkage and ionisation isomerism	1
10.	Order is two	1
11.	(C) 2-Methyl bhutan-2-ol	1
12.	(D) 2.0 M	1
13.	(A) reduced form is more stable compared to hydrogen gas.	1
14.	(D) 5	1
15.	(A) They are chemically reactive	1
16.	(i) Both assertion (A) and reason (R) are correct statements, and reason (R) is the correct explanation of the assertion (A).	1
17.	(iii) Assertion (A) is correct, but reason (R) is incorrect statement.	1

18.	(i) Both assertion (A) and reason (R) are correct statements, and reason (R) is the correct explanation of the assertion (A).	1
19.	(i) Both assertion (A) and reason (R) are correct statements, and reason (R) is the correct explanation of the assertion (A).	1
20.	(iii) Assertion (A) is correct, but reason (R) is incorrect statement.	1
	SECTION – B	
21.	a) Due to intermolecular H-bonding in alcohol b) Due to resonance C = O is attained in phenol	2
22.	Tranquilizers reduces the mental stress and acts as a part of anti depressants Eg: Barbituaric acid derivatives Analgesics: These are pain killers Eg: Aspirin b) Antiseptics reduces bacterial growth on animate object Disinfectants controls bacterial growth or non animate objects **OR** In cationic detergents cation acts an detergent Eg: Cetyl trimethyl ammonium bromide. In Anionic detergents, anion acts as detergent Eg: Sodium lauryl sulphate	2
23.	a) $2MnO_4^- + H_2O + I^- \longrightarrow 2MnO_2 + IO_3^- + 2OH^-$ b) $2MnO_4^- + 10I^- + 16H^+ \longrightarrow 2Mn^{+2} + 5I_2 + 8H_2O$	2
24.	Rate $\propto [A]^1$; rate $\propto [B]^1$ Average rate is measured in average interval of time and instantaneous rate is measured in an instant of time.	2
25.	The curves obtained by plotting fraction of gas adsorbed Verses pressure at constant temperature is known as adsorption isotherm	2

	$\frac{x}{m} = k.p^{\frac{1}{n}}$ $x \rightarrow$ mass of adsorbate $m \rightarrow$ mass of adsorbant **OR** Shape selective catalysis Catalyst activity depends upon shape & size of pores present in the catalyst. ZSM5 is used to convert ethanol to gasoline.	
26.	$Ni \mid Ni^{+2} \parallel Cu^{+2} \mid Cu$ $E = E^{\circ} - \frac{0.059}{2} \log \frac{[Ni^{+2}]}{[Cu^{+2}]}$	2
27.	a) Solute associates b) solute dissociates	2
	SECTION – C	
28.	28. a) $CH_2 = C - CH = CH_2$ $\quad\quad\quad\quad \mid$ $\quad\quad\quad\quad Cl$ b) $NH_2 - (CH_2)_6 - NH_2, COOH$ $\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad \mid$ $\quad\quad\quad\quad\quad\quad\quad\quad\quad (CH_2)_4 - COOH$ c)	3

	 **OR** i) $NH_2-(CH_2)_6-NH_2$ hexamethylene diamine , $\begin{array}{l} COOH \\ \mid \\ (CH_2)_4-COOH \end{array}$ Adipic acid ii) $CH_2=CH-CH=CH_2$ 1,3 – butadiene  Styrene iii) $\begin{array}{l} CH_2=C-CH=CH_2 \\ \quad\quad\;\; \mid \\ \quad\quad\;\; Cl \end{array}$ 2-chloro-1,3-butadiene	
29.	a) Potassium hexa cyanido manganate (II) $Mn^{+2} is [Ar]3d^5$ $t_2g^5eg^0$ b) Stability of complexes increases due to presence of bidentate ligands eg:[Co(en)3]$^{+3}$ **[OR]** i) $\left[Fe(CN)_6\right]^{-4}$ 1 d^2sp^3 – diamagnetic ii) $\left[CO\ F_6\right]^{-3}$ 1 sp^3d^2 – Paramagnetic	3

	iii) $\left[Ni(CO)_4\right]$ 1 $sp^3 -$ diamagnetic	
30.	SN 1  1 < 2 < 3 SN 2  3 < 2 < 1	3
31.	a) Due to +R effecting NH_2 group ion electrons are not localized 1 b) Since aniline form a salt with lewis and $AlCl_3$ 1 c) Since Aryl halide are less reactive towards nucleophilic substitution reaction 1	
32.	$Al_2O_3 + 2NaOH + 3H_2O \longrightarrow 2NaAl(OH)_4$ 1 $2NaAl(OH)_4 + CO_2 \longrightarrow Al_2O_3.X\,H_2O$ 1 $Al_2O_3.XH_2O \longrightarrow Al_2O_3 + XH_2O$ 1	
33.	Limiting molar conductivity of an electrolyte is sum of individual limiting molar conductivities of ions. 1 $\Lambda_m^o \text{ of } Sr^{+2} = 119\,SCm^{-2}mol^{-1}$	

	$\Lambda_m^o \text{ of } NO_3^- = 72 SCm^{-2}mol^{-1}$ $\Lambda_m^o \; Sr(NO_3)_2 = 119 + 144 = 263 SCm^{-2}mol^{-1}$ 2	
34.	$\Delta T_f = \frac{K_f \times \omega \times 1000}{GM\omega \times \omega}$ 1 $= \frac{1.86 \times 31 \times 1000}{62 \times 600}$ $= \frac{18.6}{12} = 1.55$ 1 Freezing point = 273 – 1.55 = 271. 45 K 1	
	SECTION – D	
35.	a) i) $CH_3CH_2COCH_2CH_3$ 3-penetanone 1 ii) $CH_3CH_2COCH_2CH_3 \xrightarrow[HCl]{Zn-Hg} CH_3CH_2CH_2CH_2CH$ n-pentane 1 b) i) $CH_3CH_2COOH \xrightarrow[red\ P]{Br_2} CH_3CH-COOH$ (with Br below the second C) 1 (HVZ reaction 2 – bromo propanoic acid) ii)  1 c) i) Benzaldehyde does not give iodoform reaction while Acetaldehyde responds to iodoform 1 **OR**	

(i)

$$CH_3COCH_3 \xrightarrow{Ba(OH)_2} \underset{(A)}{CH_3CCH_2COCH_3}$$

$$\begin{array}{c} CH_3 \\ | \\ CH_3CCH_2COCH_3 \\ | \\ OH \end{array}$$

$$(A) \downarrow \Delta$$

$$\underset{(C)}{+CHI_3} \longleftarrow \underset{\underset{(B)}{CH_3}}{\underset{|}{CH_3-C}}=CHCOCH_3$$

$$\underset{\underset{(D)}{CH_3}}{\underset{|}{CH_3-C}}=CHCOONa$$

(ii)

$$A \rightarrow \begin{array}{c} CH_3 \\ | \\ CH_3-C-CH_2COCH_3 \\ | \\ OH \end{array} \quad 1$$

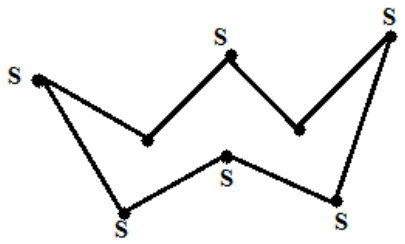
$$B \rightarrow \begin{array}{c} CH_3-C-CHCOCH_3 \\ | \\ CH_3 \end{array} \quad 1$$

$$C \rightarrow CHI_3 \quad 1$$

$$D \rightarrow \begin{array}{c} CH_3-C=CHCOONa \\ | \\ CH_3 \end{array} \quad 1$$

iii) 4-hydroxy-4-methyl-2-pentanone

	b) i) Ethanol does not give reaction with $NaHSO_3$ while propanone gives white crystalline precipitate with $NaHCO_3$ ii) Benzoic acid give violet colour with $FeCl_3$ 1	
36.	a) i) Zero order 1 ii) Rate constant 1 iii) mol L^{-1} s^{-1} 1 b) $K = \frac{2.303}{25}\log_{10}\frac{100}{75}$ 1 $K = \frac{2.303}{25}\times(\log 4 - \log 3)$ $K = \frac{2.303\times 0.1249}{25} = \frac{0.2976}{25} = 1.15\times 10^{-2} mol^{-1}$ $= \frac{0.693}{K}$ $= \frac{0.693}{0.0115}$ $= 60.2$ min 1 **[OR]** a) $t_{1/2} = \frac{0.693}{K} = \frac{0.691}{60} = 0.0115$ 1 0.0115 0.0115 0.0115 0.0115 $1 — \frac{1}{2} — \frac{1}{4} — \frac{1}{8} — \frac{1}{16}$ $= 4\times t_{1/2}$ 1 $= 4\times 0.0115$ $= 0.046 s^{-1}$ 1 b) i) concentration of reactants 1 ii) temperature1 c) i) greater than or equal to threshold energy 1 ii) lesser activation emerge barriers	
37.	a) A $\rightarrow$ Sulphur	5



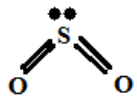
B → SO_2

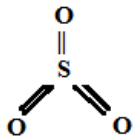
C → SO_3

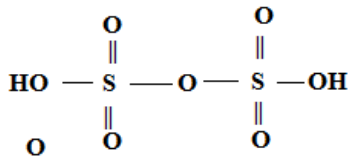
D → $H_2S_2O_7$

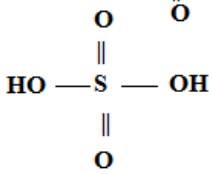
E → H_2SO_4

F → $CuSO_4$









b) $Cu + 2H_2SO_4 \longrightarrow CuSO_4 + 2H_2O + SO_2$

c) i) In the preparation of fertilizers

ii) Paper industry

[OR]

a) due to high electronegativity and positive SRP 1

b) Due to very weak vander waal's forces. 1

iii) Due to smaller size of 'O' 1

b) $2NaOH + Cl_2 \longrightarrow NaCl + NaOCl + H_2O$ 1

	$2I^- + H_2O + O_3 \longrightarrow I_2 + 2OH^- + O_2$ 1	