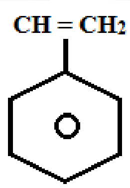
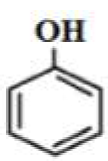
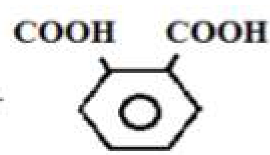
CBSE Class 12 Chemistry Question Paper 2020 Solution Set 3

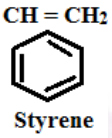
CHEMISTRY STANDARD

SOLVED SET 3 (CODE: 30/5/3)

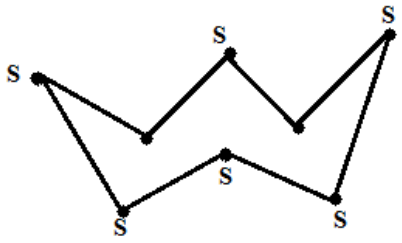
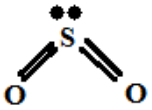
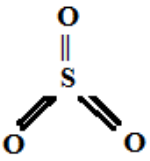
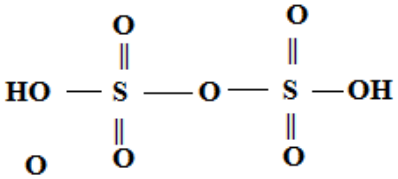
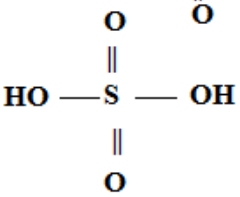
Q. NO	SOLUTION	TOTAL MARKS
	SECTION – A	
1.	Peptide linkage	1
2.	These are not synthesized by body to be supplied in diet.	1
3.	Organic compounds with $-NH_2$ and COOH group are known as amino acids.	1
4.	Due to the formation of zwitter ion	1
5.	Acidic amino acids have more –COOH groups and basic amino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

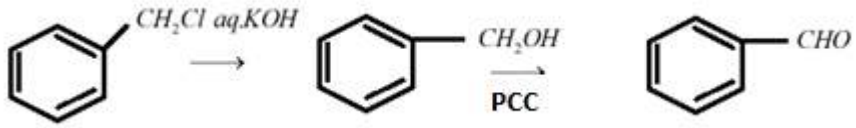
17.	(iii) Assertion (A) is correct, but reason (R) is incorrect statement.	1
18.	(iii) Assertion (A) is correct, but reason (R) is incorrect statement.	1
19.	(i) Both assertion (A) and reason (R) are correct statements, and reason (R) is the correct explanation of the assertion (A).	1
20.	(i) Both assertion (A) and reason (R) are correct statements, and reason (R) is the correct explanation of the assertion (A).	1
	SECTION – B	
21.	a) Solute dissociates b) Solute associates	2
22.	$2I^- \mid I_2 \parallel F_2 \mid 2F^-$	2
23.	a) $MnO_4^- + 5Fe^{2+} + 8H^+ \longrightarrow Mn^{+2} + 5Fe^{3+} + 4H_2O$ 1 b) $2MnO_4^- + Mn^{+2} + 2H_2O \longrightarrow 3MnO_2 + 4OH$ 1	
24.	Tranquilizers reduces the mental stress and acts as a part of anti depressants 1 Eg: Barbituaric acid derivatives Analgesics: These are pain killers 1 Eg: Aspirin b) Antiseptics reduces bacterial growth on animate object 1 Disinjectants controls bacterial growth or non animate objects 1 **OR** In cationic detergents cation acts an detergent Eg: Cetyl trimethyl ammonium bromide. 1 In Anionic detergents, anion acts as detergent 1 Eg: Sodium lauryl sulphate	
25.	a) Due to intermolecular H-bonding in alcohol 1 b) Due to resonance C = O is attained in phenol 1	

26.	The curves obtained by plotting fraction of gas adsorbed Verses pressure at constant temperature is known as adsorption isotherm $\frac{x}{m} = k.p^{\frac{1}{n}}$ $x \rightarrow$ mass of adsorbate $m \rightarrow$ mass of adsorbant **OR** Shape selective catalysis. ZSM 5 is used in oil refining and in petroleum products 2	2
27.	Rate $\propto [A]^1$; rate $\propto [B]^1$ 1 Average rate is measured in average interval of time and instantaneous rate is 1 measured in an instant of time.	
SECTION – C		
28.	a) $CH_2 = C - CH = CH_2$ $\quad\quad \vert$ $\quad\quad CH_3$ 1 b) $CH_2 = CH - CH = CH_2 +$  1 c) CH₂OH  + HCHO 1 OR a) CH₂OH | CH₂OH +  1	

	b) CF2 = CF2 1 c) CH_3CHCH_2COOH $CH_3CHCH_2CH_2COOH$ | + | 1 OH OH **OR** i) $NH_2-(CH_2)_6-NH_2$ hexamethylene d–iamine 1 ii) $CH_2=CH-CH=CH_2$ 1  Styrene 1,3 – butadiene iii) $CH_2=C-CH=CH_2$ | 1 Cl 2-chloro-1,3-butadiene	
29.	$Ag_2S+4NaCN\longrightarrow 2Na\left[Ag(CN)_2\right]+Na_2S$ 1 $2Na\left[Ag(CN)_2+Zn\right]\longrightarrow Na_2\left[Zn(CN)_4\right]$ 1 Zinc displaces silver from complex 1	
30.	Molar conductivity at infinite dilution is the sum of individual limits molar conductivities of ions 1 $\Lambda_m^o \text{ of } Ba^{+2}=127\ SCm^2mol^{-1}$ $\Lambda_m^o \text{ of } OH^-=199\ SCm^2$ $\Lambda_m^o \text{ of } Ba(OH)_2=127+2\times199$ 1	

	$= 525\, SCm^2 mol^{-1}$ 1	
31.	$\Delta T_f = \frac{K_f \times \omega \times 1000}{GM\omega \times \omega}$ 1 $= \frac{1.86 \times 31 \times 1000}{62 \times 600}$ 1 $= \frac{18.6}{12} = 1.55$ Freezing point = 273 – 1.55 = 271. 45 K 1	
32.	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	
33.	a) Potassium hexa cyanide manganate (II) $Mn^{+2}[A]$ is $3d^5$ t_2g^5eg b) Stability of complexes increases due to presence of bidentate ligands eg:[Co(en)3]$^{+3}$ **[OR]** i) $\left[Fe(CN)_6\right]^{-4}$ d^2sp^3 – diamagnetic ii) $\left[CO\ F_6\right]^{-3}$ sp^3d^2 – Paramagnetic iii) $\left[Ni(CO)_4\right]$ sp^3 – diamagnetic	3
34.	a) S_N1	3

	Ethyl chloride < isoerophyl chloride < t-butyl chloride (stability of carbocation) b) S_N2 t-butyl chloride < isopropyl chloride < ethyl chloride (3°), (2°), (1°),	
	SECTION – D	
35.	a) A → Sulphur  B → SO_2 C → SO_3 D → $H_2S_2O_7$ E → H_2SO_4 F → $CuSO_4$    	5

	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 b) Due to very weak vander waal's forces. iii) Due to smaller size of 'O' b) $2NaOH + Cl_2 \longrightarrow NaCl + NaOCl + H_2O$ $2I^- + H_2O + O_3 \longrightarrow I_2 + 2OH^- + O_2$	5
36.	a) i) $CH_3CH_2COCH_2CH_3$ 3-penetanone ii) $CH_3CH_2COCH_2CH_3 \xrightarrow[HCl]{Zn-Hg} CH_3CH_2CH_2CH_2CH$ n-pentane b) i) $CH_3CH_2COOH \xrightarrow[red\ P]{Br_2} CH_3CH(Br)-COOH$ (HVZ reaction 2 – bromo propanoic acid) ii)  c) i) Benzaldehyde does not give iodoform reaction while Acetaldehyde responds to iodoform **OR** **5**	5

(i)

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

(A)

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

(B)

$$CH_3-C=CHCOONa$$

(D)

(ii)

$$A \rightarrow CH_3-C(OH)(CH_3)-CH_2COCH_3$$

$$B \rightarrow CH_3-C(CH_3)=CHCOCH_3$$

$$C \rightarrow CHI_3$$

$$D \rightarrow CH_3-C(CH_3)=CHCOONa$$

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

b) i) Ethanol does not give reaction with $NaHSO_3$ while propanone give PPT with $NaHCO_3$

ii) Benzoic acid give violet colour with $FeCl_3$

37.	a) i) Zero order ii) Rate constant iii) mol L^{-1} s^{-1} b) $K = \frac{2.303}{25}\log_{10}\frac{100}{75}$ $K = \frac{2.303}{25}\times(\log 4 - \log 3)$ $K = \frac{2.303\times 0.1249}{25} = \frac{0.2976}{25} = 1.15\times 10^{-2} mol^{-1}$ $= \frac{0.693}{K}$ $= \frac{0.693}{0.0115}$ $= 60.2 \text{ min}$ **[OR]** a) $t_{1/2} = \frac{0.693}{K} = \frac{0.691}{60} = 0.0115$ $1 \xrightarrow[0.0115]{} \frac{1}{2} \xrightarrow[0.0115]{} \frac{1}{4} \xrightarrow[0.0115]{} \frac{1}{8} \xrightarrow[0.0115]{} \frac{1}{16}$ $= 4\times t_{1/2}$ $= 4\times 0.0115$ $= 0.046 s^{-1}$ b) i) concentration of reactants ii) temperature c) i) greater than or equal to threshold energy ii) lesser activation emerge barriers	5 5