## CBSE Class 12 Chemistry Question Paper 2020
### Solution Set 3 (CODE: 30/5/3)

<table>
<thead>
<tr>
<th>Q. NO</th>
<th>SOLUTION</th>
<th>TOTAL MARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Peptide linkage</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>These are not synthesized by body to be supplied in diet.</td>
<td>1</td>
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<tr>
<td>3.</td>
<td>Organic compounds with $-NH_2$ and COOH group are known as amino acids.</td>
<td>1</td>
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<tr>
<td>4.</td>
<td>Due to the formation of zwitter ion</td>
<td>1</td>
</tr>
<tr>
<td>5.</td>
<td>Acidic amino acids have more $-COOH$ groups and basic amino acids have more $NH_2$ groups</td>
<td>1</td>
</tr>
<tr>
<td>6.</td>
<td>Leaching</td>
<td>1</td>
</tr>
<tr>
<td>7.</td>
<td>Linkage and ionisation isomerism</td>
<td>1</td>
</tr>
<tr>
<td>8.</td>
<td>Desorption</td>
<td>1</td>
</tr>
<tr>
<td>9.</td>
<td>Zinc</td>
<td>1</td>
</tr>
</tbody>
</table>
| 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           |
### SECTION – B

<p>| | |</p>
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| 21. | a) Solute dissociates  
b) Solute associates |
| 22. | $2I^- \, |I_2| \, |F_2| \, 2F^-$ |
| 23. | a) $MnO_4^- + 5Fe^{2+} + 8H^+ \rightarrow Mn^{2+} + 5Fe^{3+} + 4H_2O$  
b) $2MnO_4^- + Mn^{2+} + 2H_2O \rightarrow 3MnO_2 + 4OH^-$ |
| 24. | 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 |
| 25. | a) Due to intermolecular H-bonding in alcohol  
b) Due to resonance $C = O$ is attained in phenol |
26. The curves obtained by plotting fraction of gas adsorbed versus pressure at constant temperature is known as adsorption isotherm.

\[ \frac{x}{m} = k.p^n \]

\( x \rightarrow \) mass of adsorbate

\( m \rightarrow \) mass of adsorbant

**OR**

Shape selective catalysis. ZSM 5 is used in oil refining and in petroleum products

27. 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.

**SECTION – C**

28. \( CH_2 = C - CH = CH_2 \)

a) \( CH_3 \)

\[ CH = CH_2 \]

b) \( CH_2 = CH - CH = CH_2 + \)

\[ \text{OR} \]

c) \( \text{CH}_2\text{OH} + \text{HCHO} \)

\[ \text{CH}_2\text{OH} + \text{COOH} \text{ COOH} \]

\( \text{a) CH}_2\text{OH} + \)
b) \( \text{CF}_2 = \text{CF}_2 \) 1

c) 
\[
\begin{align*}
\text{CH}_3\text{CHCH}_2\text{COOH} & \quad \text{CH}_3\text{CHCH}_2\text{CH}_2\text{COOH} \\
\quad + & \quad 1 \\
\text{OH} & \quad \text{OH}
\end{align*}
\]

OR

i) \( \text{NH}_2 - (\text{CH}_2)_6 - \text{NH}_2 \) hexamethylene diamine 1

ii) \( \text{CH}_2 = \text{CH} - \text{CH} = \text{CH}_2 \) 1

\( \text{CH} = \text{CH}_2 \)

Styrene

1,3 – butadiene

iii) 
\[
\begin{align*}
\text{CH}_2 = \text{C} - \text{CH} = \text{CH}_2 & \quad 1 \\
\quad \text{Cl}
\end{align*}
\]

2-chloro-1,3-butadiene

29. \( \text{Ag}_2\text{S} + 4\text{NaCN} \rightarrow 2\text{Na}[\text{Ag(CN)}_2] + \text{Na}_2\text{S} \) 1

\[
2\text{Na}[\text{Ag(CN)}_2 + \text{Zn}] \rightarrow \text{Na}_2[\text{Zn(CN)}_4] \]

Zinc displaces silver from complex 1

30. Molar conductivity at infinite dilution is the sum of individual limits molar conductivities of ions 1

\[ \Lambda_m^o \text{ of } \text{Ba}^{2+} = 127 \text{ SM}^2\text{mol}^{-1} \]

\[ \Lambda_m^o \text{ of } \text{OH}^- = 199 \text{ SM}^2 \]

\[ \Lambda_m^o \text{ of } \text{Ba(OH)}_2 = 127 + 2 \times 199 \]
\[ 525 \text{ SCm}^2 \text{ mol}^{-1} \]

31. \( \Delta T_f = \frac{K_f \times \omega \times 1000}{GM \omega \times \omega} \)

\[ = \frac{1.86 \times 31 \times 1000}{62 \times 600} \]

\[ = \frac{18.6}{12} = 1.55 \]

Freezing point = 273 – 1.55

= 271.45 K

32. a) Due to +R effecting NH\(_2\) group ion electrons are not localized
b) Since aniline form a salt with lewis and AlCl\(_3\)
c) Since Aryl halide are less reactive towards nucleophilic substitution reaction

33. a) Potassium hexa cyanide manganate (II)

\[ Mn^{2+}[A] \text{ is } 3d^5 \]

\[ t_2g^5eg \]

b) Stability of complexes increases due to presence of bidentate ligands

eg: [Co(en)\(_3\)]\(^{3+}\)

[OR]

i) \([Fe(CN)_6]^{4-}\)

\[ d^2sp^3 - \text{diamagnetic} \]

ii) \([COF_6]^{-3}\)

\[ sp^3d^2 - \text{Paramagnetic} \]

iii) \([Ni(CO)_4] \)

\[ sp^3 - \text{diamagnetic} \]

34. a) S\(_N\)1
Ethyl chloride < isoerophyl chloride < t-butyl chloride
(stability of carbocation)
b) SN2
t-butyl chloride < isopropyl chloride < ethyl chloride
(3°), (2°), (1°),

SECTION – D

35. a) A → Sulphur

B → SO₂
C → SO₃
D → H₂S₂O₇
E → H₂SO₄
F → CuSO₄
b) \( Cu + 2H_2SO_4 \rightarrow CuSO_4 + 2H_2O + SO_2 \)

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) \( 2NaOH + Cl_2 \rightarrow NaCl + NaOCl + H_2O \)
   \( 2I^- + H_2O + O_3 \rightarrow I_2 + 2OH^- + O_2 \)

36. a) i) \( CH_3CH_2COCH_2CH_3 \)
   3-pentanone
   ii) \( CH_3CH_2COCH_2CH_3 \xrightarrow{Zn-Br_2\text{HCl}} CH_3CH_2CH_2CH_2CH \)
   n-pentane
   \( CH_3CH - COOH \)
   b) i) \( CH_3CH_2COOH \xrightarrow{Br_2\text{redP}} \)
   \( \text{Br} \)
   (HVZ reaction 2 – bromo propanoic acid)
   ii)
   c) i) Benzaldehyde does not give iodoform reaction while Acetaldehyde responds to iodoform

OR 5
(i) \[ \text{CH}_3 \text{COCH}_3 \xrightarrow{\text{Bif(OH)}} \text{CH}_3 \text{CCH}_2 \text{COCH}_3 \]

\[ \text{OH} \]

(A) \( \Delta \)

\[ + \text{CHI}_3 \xleftarrow{\text{C}} \text{CH}_3 - C = \text{CHCOCH}_3 \]

\[ \text{CH}_3 \]

\[ \text{CH}_3 - C = \text{CHCOONa} \]

\[ \text{CH}_3 \]

(ii)

\[ \text{A} \rightarrow \text{CH}_3 - C - \text{CH}_2 \text{COCH}_3 \]

\[ \text{OH} \]

\[ \text{B} \rightarrow \text{CH}_3 - C - \text{CHCOCH}_3 \]

\[ \text{CH}_3 \]

\[ \text{C} \rightarrow \text{CHI}_3 \]

\[ \text{D} \rightarrow \text{CH}_3 - C = \text{CHCOONa} \]

\[ \text{CH}_3 \]

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) \( \text{mol L}^{-1} \text{s}^{-1} \)

b) \( K = \frac{2.303}{25} \log_{10} \frac{100}{75} \)

\[ K = \frac{2.303}{25} \times (\log 4 - \log 3) \]

\[ K = \frac{2.303 \times 0.1249}{25} = \frac{0.2976}{25} = 1.15 \times 10^{-2} \text{ mol}^{-1} \]

\[ = \frac{0.693}{K} \]

\[ = \frac{0.693}{0.0115} \]

\[ = 60.2 \text{ min} \]

[OR]

a) \( t_{1/2} = \frac{0.693}{K} = \frac{0.691}{60} = 0.0115 \)

\[ = 4 \times t_{1/2} \]

\[ = 4 \times 0.0115 \]

\[ = 0.046 \text{ s}^{-1} \]


b) i) concentration of reactants  
ii) temperature  

c) i) greater than or equal to threshold energy  
ii) lesser activation emerge barriers