Question 1

A.

i) \( c \sqrt{b} \)

- Odd mass seeds
- \( n \) or \( p \)

- 151/153 indicates \( b \)

ii) \( m - 28 = m - co \)

- or \( m - (a + 4) \)

iii) \( 107 = m - 44 \)

- \( m = CO_2 \)

- or \( m = CO \) or \( NH_2 \)

iv) \( 72 = m - 19 \) = loss of Branne

v) \( 55 = 72 - 17 \) = indicates N\(_2\) or ammonia

vi) \( 44 = CO_2 \) or \( CO \) or \( NH_2 \)
B)

i) $127 = \text{molecular ion} \\
\text{in } \text{Sily.} \text{ and E.} \\
\text{CN}$

ii) $100 = m - \text{CN}$

iii) $89 = m - 40 \\
\text{in } \text{C}_2\text{H}_3\text{N}_2$

iv) $84 = m - 44 = m - \text{C}-\text{NH}_2$

v) $\text{C}_2\text{H}_2 - \text{C} - \text{NH}_3$

vi) $\text{C}_2\text{H}_2 - \text{C} - \text{NH}_3$

vii) $\text{C}_2\text{H}_2 - \text{C} - \text{NH}_3$

viii) $31 = \text{CH}_2\text{-CH}$

$30 = \text{CH}_2\text{-NH}$

$29 = \text{C}_2\text{H}_5\text{NH}_3$ or $\text{CH}_3\text{NH}_2$
Cyanoacetylene

**Formula:** C₂H₂N₂

**Molecular weight:** 40.05

**IUPAC Standard Name:**

- Nitrilicethene
- Cyanogen methene
- Cyanomethene
- Cyanoacetylene
- Cyanomethylene
- Sulfurized ethene

**CAS Registry Number:** 148-66-2

**Chemical Structure:**

- This structure is also available as a 3D Mol file or as a rendered 2D ID
- The 3D structure may be viewed using Jmol or O梅.
- Other names:
  - Cyanethylidene
  - Dicyanoethylenecyclobutadiene

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**Mass Spectrum (Electron Ionization)**

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- Mass library and printed spectrum (not to be printed for hardcopy publication).
- More spectra are in EDS revision.
- Described spectra in ICDP-ZDE report.

**Chemical**

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Question 2

(i) \( m^\ast + e \rightarrow n \rightarrow \text{fregemb} \)

For left-right forces, forces \( C = 0 \)

\[ c = m_{12} \]

(ii) the \([L_3B_3S + 2(21)] \) peak

at \( \frac{m}{m} \) 800

(iii)

\( P^1 \text{H}_1^2 \text{H}_3^2 \text{N} \text{Q} \text{L}_{11}^2 \text{W} \text{A}_{1}^2 \text{N} \text{I}_{1}^2 \text{V} \text{H}_{1}^2 \text{L} \text{M} \text{L}_{1}^2 \)

(iv) yes, \( G \) and \( Z \to 0 \)

(v) any atom contains \( O_2 \) will be \( 18 \) due to light.

Any atom containing \( O_2 \) will be

1. \( \text{O}_2 \) light.

(vi) \( O_2 \)
b) i) Sulfur dioxide
decolour

ii) to have a handle

\[
\text{Use } \frac{\text{mass difference}}{\text{mass at the } \text{fuser point}}
\]

\[
\text{Use } \frac{\text{mass at } \text{fuser point}}{\text{mass difference}}
\]

\[
\text{Use } \frac{\text{mass difference}}{\text{mass at } \text{fuser point}}
\]

\[
\text{Use } \frac{\text{mass at } \text{fuser point}}{\text{mass difference}}
\]

\[
\text{Use } \frac{\text{mass at } \text{fuser point}}{\text{mass difference}}
\]

\[
\text{Use } \frac{\text{mass difference}}{\text{mass at } \text{fuser point}}
\]

\[
\text{Overall quadrupole act the filter point}
\]

\[
0.9002 = 1 - \frac{\text{mass at } \text{fuser point}}{\text{mass difference}}
\]

\[
q_n = 0
\]
(iv) \( M = \text{R}^n \quad \text{or} \quad \text{O} \)

15 = \text{CH}_3

16 = \text{O} \quad \text{or} \quad \text{NH}_2 \quad \text{or} \quad \text{CH}_4

17 = \text{OH} \quad \text{or} \quad \text{NH}_3

18 = \text{OH}_2

(2)

\[ \text{NH}_2 - c - \text{NH} - c - \text{OH}_2 - \text{C} = \text{N} \]
(vii) \[ \begin{align*} 
28 &= CO_{2}^{+} \text{ or } CO_{3}^{2-} \\
27 &= C_2H_3^{+} \\
29 &= C_2H_5^{+} \text{ or } HCO^{+} \\
30 &= +CH_2NH_2 \\
\end{align*} \]

(viii) \[ \begin{align*} 
16 &= NH_{2} \text{ or } CH_4 \text{ or } O \\\n17 &= NH_3 \text{ or } OH \\\n18 &= H_2O \\
\end{align*} \]

2) Yes - explains all the peaks. Is M+.

3) \[ \text{Diagram of a molecule with } \text{NH}_{3} \text{ attached to a carbon atom.} \]