(1) Spse 1110 is the Venn-diagram message and is received as 1110001. Can we recover it?

According to the Venn-diagram method, if the message is 1110 then the code-word is

\[ \text{received word is } 1110001 \]

hence it made 3 errors.

SO we CANNOT recover it, because the Venn-diagram method has error-correcting capacity of 2.
You proposed a code in which each 3-digit message \(a_1a_2a_3\) has a parity check \(c_c = a_2 + a_3\).

What can you say about the error-detecting and error-correcting capability of the code?

\[
\begin{array}{ccc|c}
\text{c}_1 & \text{a}_2 & \text{a}_3 & \text{c}_c = a_2 + a_3 \\
0 & 0 & 0 & 0 \\
0 & 0 & 1 & 1 \\
0 & 1 & 0 & 1 \\
0 & 1 & 1 & 0 \\
1 & 0 & 0 & 1 \\
1 & 0 & 1 & 0 \\
1 & 1 & 0 & 0 \\
1 & 1 & 1 & 1 \\
\end{array}
\]

The weight \(w\) of the code is 2.

So the error detecting capability is \(\frac{2 - w}{2} = 0\).

And the error correcting capability is \(2 - 1 = 1\).