Consider $m = 2$.
(i) For a fixed $x_1 \in \mathbb{R}$, we have

$$\begin{aligned}
\lim_{x_2 \to \infty} F_{X_1,X_2}(x_1, x_2) &= \lim_{n \to \infty} F_{X_1,X_2}(x_1, n) \\
&= \lim_{n \to \infty} P(\underbrace{\{X_1 \le x_1\} \cap \{X_2 \le n\}}_{=A_n \uparrow}) \\
&= P\left(\bigcup_{n=1}^{\infty} A_n\right) \\
&= P(X_1 \le x_1).
\end{aligned}$$

Therefore,

$$\begin{aligned}
\lim_{x_1 \to \infty} \lim_{x_2 \to \infty} F_{X_1,X_2}(x_1, x_2) &= \lim_{x_1 \to \infty} P(X_1 \le x_1) \\
&= \lim_{n \to \infty} P(\underbrace{X_1 \le n}_{=A_n \uparrow}) \\
&= P\left(\bigcup_{n=1}^{\infty} A_n\right) \\
&= P(\Omega) \\
&= 1.
\end{aligned}$$

(ii) For a fixed $x_2 \in \mathbb{R}$, we have

$$\begin{aligned}
\lim_{x_1 \to -\infty} F_{X_1,X_2}(x_1, x_2) &= \lim_{n \to \infty} P(\underbrace{\{X_1 \le -n\} \cap \{X_2 \le x_2\}}_{=B_n \downarrow}) \\
&= P\left(\bigcap_{n=1}^{\infty} B_n\right) \\
&= P(\phi) \\
&= 0.
\end{aligned}$$

You can find some examples in the first few pages of the following note:
https://www.stat.uchicago.edu/ stigler/Stat244/ch3withfigs.pdf.