$$
\begin{aligned}
\Delta_{۴}(t) &= F_{H_{۲}}(t) \int_{۰}^{t} \int_{۰}^{v} F_{Y_{۲}}(t-\delta(u)) F_{Y_{۱}}(t-\delta(v)) \eta(u,v) du dv \qquad (۱) \\
&\quad + F_{H_{۲}}(t) \int_{۰}^{t} \int_{v}^{t} F_{Y_{۲}}(t-\delta(u)) F_{Y_{۱}}(t-\delta(v)) \eta(u,v) du dv \\
&= F_{H_{۲}}(t) \int_{۰}^{t} \int_{۰}^{v} F_{Y_{۲}}(t-\delta(u)) F_{Y_{۱}}(t-\delta(v)) \eta(u,v) du dv \\
&\quad + F_{H_{۲}}(t) \int_{۰}^{t} \int_{۰}^{u} F_{Y_{۲}}(t-\delta(u)) F_{Y_{۱}}(t-\delta(v)) \eta(u,v) du dv \\
&= F_{H_{۲}}(t) \int_{۰}^{t} \int_{۰}^{v} F_{Y_{۲}}(t-\delta(u)) F_{Y_{۱}}(t-\delta(v)) \eta(u,v) du dv \\
&\quad + F_{H_{۲}}(t) \int_{۰}^{t} \int_{۰}^{v} F_{Y_{۲}}(t-\delta(v)) F_{Y_{۱}}(t-\delta(u)) \eta(v,u) du dv \\
&= F_{H_{۲}}(t) \int_{۰}^{t} \int_{۰}^{v} \xi_{۱}(u,v) \eta(u,v) du dv
\end{aligned}
$$