Redefine merged composition \( P \parallel Q \) (Exercise 485) so that if \( P \) and \( Q \) agree on a changed value for a variable, then it has that final value, and if they disagree on a changed value for a variable, then its final value is

(a) arbitrary.
(b) either one of the two changed values.

After trying the question, scroll down to the solution.
(a) arbitrary.  
\[ P \parallel Q = \exists x_P, x_Q, y_P, y_Q, ..., t_P, t_Q : \]
\[ \langle x', y', ..., t': P \rangle x_P y_P ... t_P \]
\[ \land \langle x', y', ..., t': Q \rangle x_Q y_Q ... t_Q \]
\[ \land (x_P = x \Rightarrow x' = x_Q) \land (x_Q = x \Rightarrow x' = x_P) \land (x_P = x_Q \Rightarrow x' = x_P) \]
\[ \land (y_P = y \Rightarrow y' = y_Q) \land (y_Q = y \Rightarrow y' = y_P) \land (y_P = y_Q \Rightarrow y' = y_P) \]
\[ \land ... \]
\[ \land t' = t_P \uparrow t_Q \]

(b) either one of the two changed values.  
\[ P \parallel Q = \exists x_P, x_Q, y_P, y_Q, ..., t_P, t_Q : \]
\[ \langle x', y', ..., t': P \rangle x_P y_P ... t_P \]
\[ \land \langle x', y', ..., t': Q \rangle x_Q y_Q ... t_Q \]
\[ \land (x_P = x \Rightarrow x' = x_Q) \land (x_Q = x \Rightarrow x' = x_P) \land (x_P = x_Q \lor x' = x_Q) \]
\[ \land (y_P = y \Rightarrow y' = y_Q) \land (y_Q = y \Rightarrow y' = y_P) \land (y_P = y_Q \lor y' = y_Q) \]
\[ \land ... \]
\[ \land t' = t_P \uparrow t_Q \]