\[ P_{\text{out}} = P_{\text{in}} = 0.3 \] (a)

\[ P_{\text{in1}} = 0.5 \\
1110000101 \\
0110000101 \\
1111111101 \\
P_{\text{in2}} = 0.8 \]

\[ P_{\text{out}} = P_{\text{in1}} \cdot P_{\text{in2}} = 0.4 \] (c)

\[ P_{\text{in1}} = 0.5 \\
...110000... \\
0110000101 \\
...01101... \\
...10101... \\
P_{\text{in2}} = 0.8 \]

\[ P_{\text{out}} = (1 - P_{\text{in1}}) \cdot P_{\text{in2}} + P_{\text{in1}} \cdot (1 - P_{\text{in2}}) = 0.5 \] (e)

\[ P_{\text{in1}} = 0.5 \\
1110000101 \\
0110000101 \\
1111111101 \\
P_{\text{in2}} = 0.8 \]

\[ P_{\text{out}} = 1 - (1 - P_{\text{in1}}) \cdot (1 - P_{\text{in2}}) = 0.9 \] (b)

\[ P_{\text{in1}} = 0.5 \\
...01001... \\
...00101... \\
...11001... \\
P_{\text{in2}} = 0.4 \]

\[ P_{\text{out}} = (1 - P_{c}) \cdot P_{\text{in1}} + P_{c} \cdot P_{\text{in2}} = 0.48 \] (f)