

#1.

a)
$$\begin{array}{r} 101110 \\ 0100001 \\ \hline \text{OR } 111111 \\ \text{AND } 000000 \\ \text{XOR } 111111 \end{array}$$

b)
$$\begin{array}{r} 11110000 \\ 10101010 \\ \hline \text{OR } 11111010 \\ \text{AND } 10100000 \\ \text{XOR } 01011010 \end{array}$$

c)
$$\begin{array}{r} 0001110001 \\ 1001001000 \\ \hline \text{OR } 1001111001 \\ \text{AND } 0001000000 \\ \text{XOR } 1000111001 \end{array}$$

d)
$$\begin{array}{r} 11111111 \\ 00000000 \\ \hline \text{OR } 11111111 \\ \text{AND } 00000000 \\ \text{XOR } 11111111 \end{array}$$

#2.

P	q	$\neg P$	$\neg q$	$P \wedge q$	$P \vee q$	$P \rightarrow q$	$\neg(P \rightarrow q)$
T	T	F	F	T	T	T	F
T	F	F	T	F	T	F	T
F	T	T	F	F	T	T	F
F	F	T	T	F	F	T	F

Application

d) $(P \wedge q) \rightarrow P$

T	\rightarrow	T
F	\rightarrow	T
F	\rightarrow	F
F	\rightarrow	F

b) $P \rightarrow (P \vee q)$

T	\rightarrow	T
T	\rightarrow	T
F	\rightarrow	T
F	\rightarrow	F

c) $\neg P \rightarrow (P \rightarrow q)$

F	\rightarrow	T
F	\rightarrow	F
T	\rightarrow	T
T	\rightarrow	T

d) $(P \wedge q) \rightarrow (P \rightarrow q)$

T	\rightarrow	T
F	\rightarrow	F
F	\rightarrow	T
F	\rightarrow	T

e) $\neg(P \rightarrow q) \rightarrow P$

F	\rightarrow	T
T	\rightarrow	T
F	\rightarrow	F
F	\rightarrow	F

f) $\neg(P \rightarrow q) \rightarrow \neg q$

F	\rightarrow	F
T	\rightarrow	T
F	\rightarrow	F
F	\rightarrow	T