

Good 15/12/17

1. a. $\sim q \wedge p$

b. $\sim p \rightarrow \sim r$

2.	P	q	$\sim p$	$(p \vee q)$	$(\sim p \wedge (p \vee q))$	$(\sim p \wedge (p \vee q)) \rightarrow q$
	T	T	F	T	F	T
	T	F	F	T	F	T
	F	T	T	T	T	T
	F	F	T	F	F	T

it is a tautology because all possible value of its propositional variable are true.

3. $\sim p \leftrightarrow q$

$\sim q \leftrightarrow p$

P	q	$\sim p$	$\sim p \leftrightarrow q$	P	q	$\sim q$	$\sim q \leftrightarrow p$
T	T	F	F	T	T	F	F
T	F	F	T	T	F	T	T
F	T	T	T	F	T	F	T
F	F	T	F	F	F	T	F

Logically

Equivalent, because the possible value of its are same.

4. OR

00 1111 0001

10 0100 1000

10 1111 1001

AND

00 1111 0001

10 0100 1000

00 0100 0000

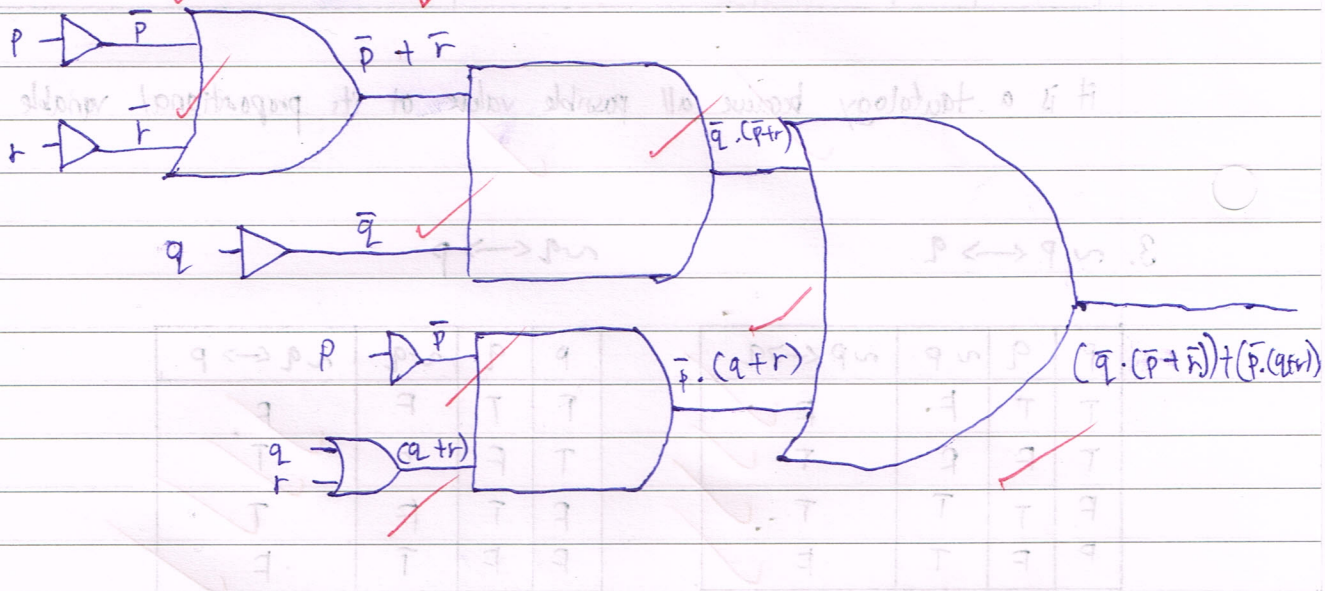
5. $(01010 \vee 11011) \oplus 01000 =$

$$\begin{array}{r} 01010 \\ \vee 11011 \\ \hline 11011 \end{array}$$

$$\begin{array}{r} 11011 \\ \oplus 01000 \\ \hline 10011 \end{array}$$

		$\vee$			$\oplus$
0	0	0	0	0	0
0	1	1	0	1	1
1	0	1	1	0	1
1	1	1	1	1	0

6.



$$(\neg p \vee \neg r) \wedge \neg q \vee (\neg p \wedge q \vee r) = (\bar{q} \cdot (\bar{p} + \bar{r})) + (\bar{p} \cdot (q + r))$$

$$\begin{array}{r} 1000 \ 1111 \ 00 \\ 0001 \ 0010 \ 01 \\ 1001 \ 1111 \ 01 \end{array}$$

$$\begin{array}{r} 1000 \ 1111 \ 00 \\ 0001 \ 0010 \ 01 \\ 0000 \ 0010 \ 00 \end{array}$$