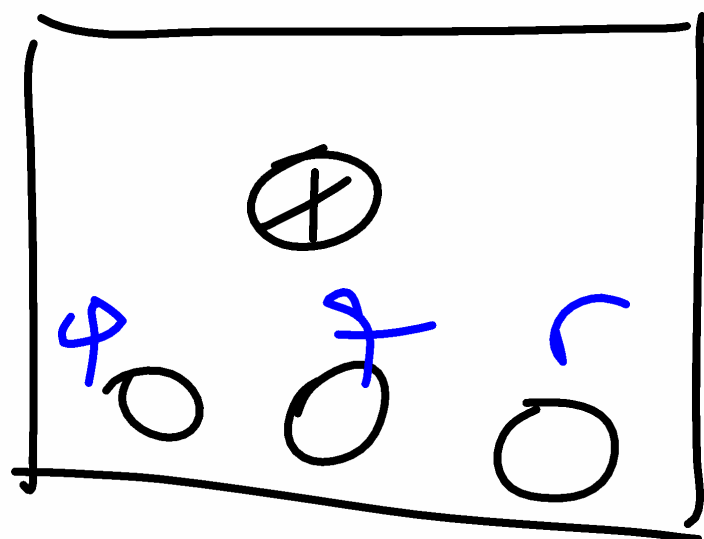


GII CS ASSIGNMENT 1 (Wed 19 Sep '18)

5



Light

a)

1	1	0
0	1	1
1	0	1

0
0

b)

$$\begin{aligned}
 & p \wedge q \wedge r \\
 & \neg p \wedge q \wedge r \\
 & p \wedge \neg q \wedge r
 \end{aligned}$$

c)

is/with
and
DN Form

$$(p \wedge q \wedge r) \vee (\neg p \wedge q \wedge r) \vee (p \wedge \neg q \wedge r)$$

$$\vee (\neg p \wedge q \wedge r) \equiv$$

$$\equiv [p \wedge (p \vee \neg p) \wedge (p \vee r) \wedge (q \vee \neg q) \wedge (q \vee r) \wedge (\neg r \vee r) \wedge (\neg r \vee \neg q)] \vee (\neg p \wedge q \wedge r)$$

⑥ $(p \vee q \vee r) \wedge (\neg(s \vee t)) \vee ((\neg p \vee \neg q \vee \neg r) \wedge (s \vee t))$

2 Cases:

Dist. $\rightarrow$

$$(p \vee q \vee r) \wedge [\neg(s \vee t) \vee (s \vee t)] \equiv (p \vee q \vee r)$$

$\wedge \alpha$

Dist. $\rightarrow$

$$(p \vee q \vee r) \wedge [\neg(s \vee t) \wedge (s \vee t)] \vee [(p \vee q \vee r) \wedge (s \vee t)]$$

$\neq$

associative

done of above $\rightarrow$

$$(p \vee q \vee r) \wedge (p \vee q \vee r) \wedge (s \vee t) \equiv (p \vee q \vee r) \wedge (s \vee t)$$

$$(7) \left(\neg(p \vee q) \wedge \neg(r \vee s \vee t) \right) \vee \neg(q \vee r)$$

2 laws: Distrib. Both gives ans. is Note of the above

$$[] \Rightarrow (\neg(p \vee q) \wedge \neg r) \vee [\neg(p \vee q) \wedge \neg(r \vee s \vee t)] \equiv$$

De Morgan

$$\equiv (\neg p \wedge \neg q) \vee (\neg p \wedge \neg q \wedge \neg r \wedge \neg s \wedge \neg t) \equiv$$

Distrib

$$\equiv (\neg p \wedge \neg q) \wedge [(\neg p \wedge \neg q) \vee (\neg r \wedge \neg s \wedge \neg t)]$$

$$(1) \xrightarrow{\text{Distrib.}} (\neg(p \vee q) \vee \neg r) \wedge [\neg(r \vee s \vee t) \vee \neg r] \xrightarrow{\text{De Morgan}} (\neg p \wedge \neg q) \wedge [$$

$$\begin{aligned}
 \textcircled{8} \quad F(p, q, r) &= (p \wedge r) \vee (r) \wedge (\neg p \vee (\neg p \wedge q)) \\
 &\xrightarrow{\text{2nd.}} () \equiv r \wedge (F \vee (p \wedge p \wedge q)) \equiv \\
 &\equiv r \wedge p \wedge q
 \end{aligned}$$