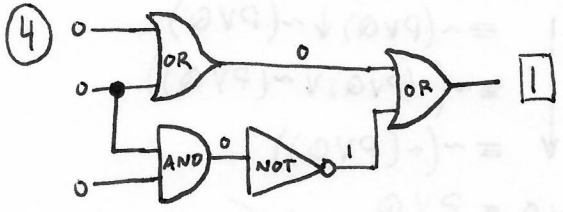


2.4 Application - Digital Logic Circuits

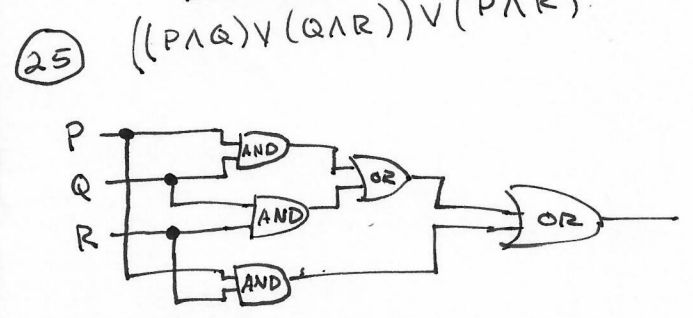
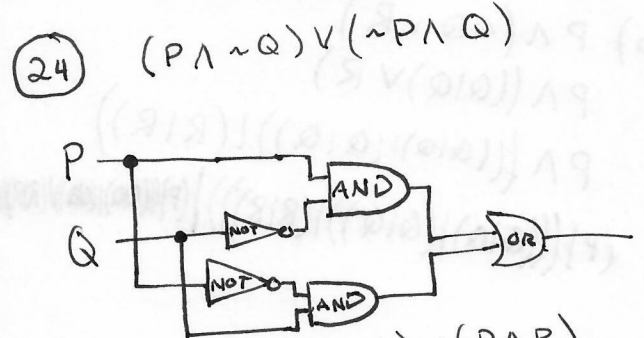
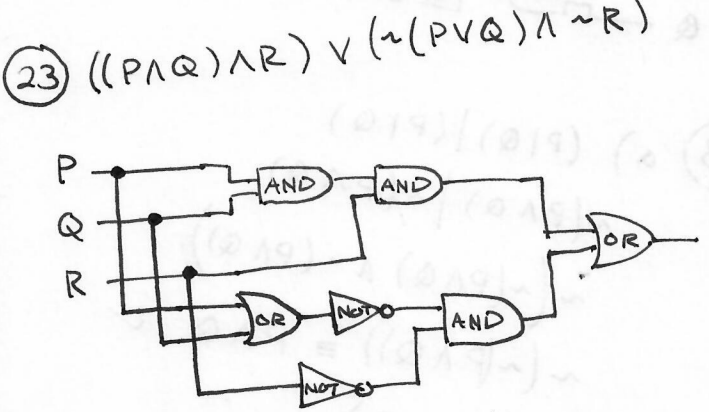
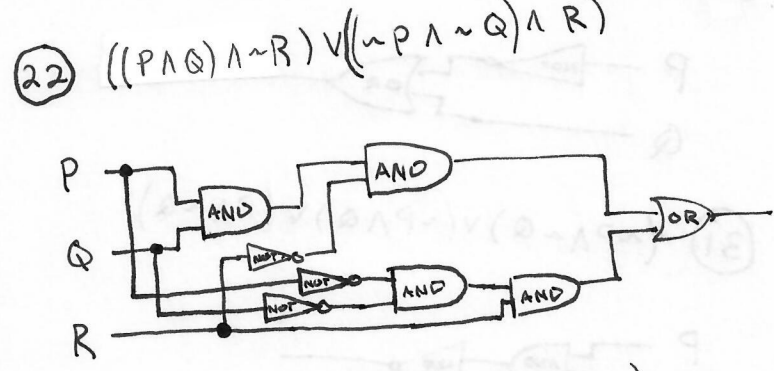
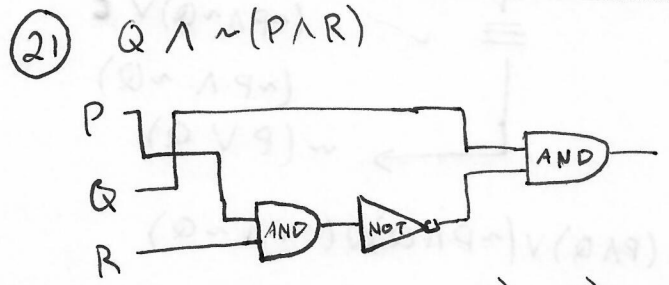
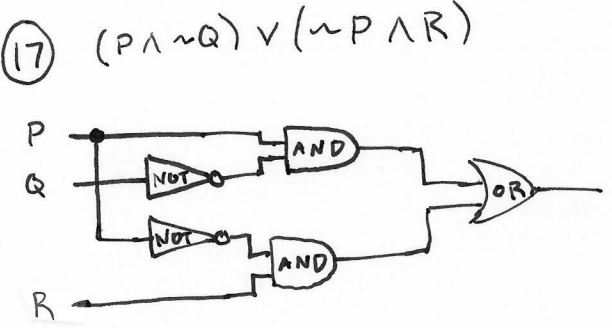
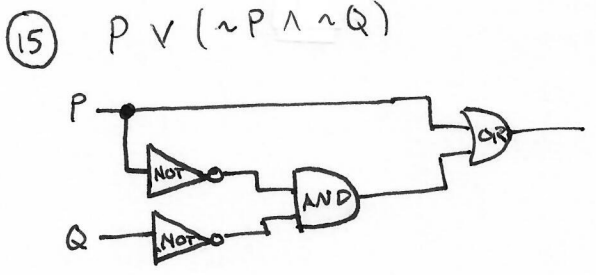
p.76 #4,8,12,15,17,21-25,27,30-31,33-34 (a≠b)



8

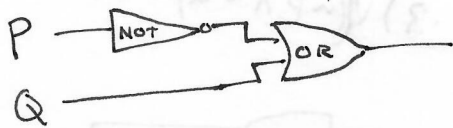
P	Q	R	PVQ	~(QAR)	(PVQ)V(~(QAR))
1	1	0	1	0	1
1	0	1	1	0	1
1	0	0	1	1	1
0	1	1	1	0	1
0	1	0	0	1	1
0	0	1	0	1	1
0	0	0	0	1	1

- 12
- $(PVQ) \vee \sim(QAR)$
 - $(PVQ) \vee \sim(Q \vee \sim R)$
 - $P \vee (Q \vee (\sim Q \vee \sim R))$
 - $P \vee ((Q \vee \sim Q) \vee \sim R)$
 - $P \vee (1 \vee \sim R)$
 - $P \vee 1$
 - 1



27 a) $\sim P \wedge \sim(Q \wedge \sim P) \rightarrow$
 b) $\sim(P \vee Q) \equiv \sim P \wedge (\sim Q \vee P)$
 $(\sim P \wedge \sim Q) \vee (\sim P \wedge P)$
 $(\sim P \wedge \sim Q) \vee \mathbf{0}$
 $(\sim P \wedge \sim Q)$
 $\equiv \sim(P \vee Q)$

30 $(P \wedge Q) \vee (\sim P \wedge Q) \vee (\sim P \wedge \sim Q)$



31 $(\sim P \wedge \sim Q) \vee (\sim P \wedge Q) \vee (P \wedge \sim Q)$



33 a) $(P|Q)|(P|Q)$
 $\sim(P \wedge Q) | \sim(P \wedge Q)$
 $\sim(\sim(P \wedge Q) \wedge \sim(P \wedge Q))$
 $\sim(\sim(P \wedge Q)) \equiv P \wedge Q$ ✓

b) $P \wedge (\sim Q \vee R)$
 $P \wedge ((Q|Q) \vee R)$
 $P \wedge (((Q|Q)|(Q|Q))|(R|R))$
 $(P|(((Q|Q)|(Q|Q))|(R|R)))|(P|(((Q|Q)|(Q|Q))|(R|R)))$

34 a) $\sim P \equiv P \downarrow P$
 $\sim P \equiv \sim(P \vee P) \equiv \sim P$ ✓

b) $P \vee Q \equiv (P \downarrow Q) \downarrow (P \downarrow Q)$
 $\equiv \sim(P \vee Q) \downarrow \sim(P \vee Q)$
 $\equiv \sim(\sim(P \vee Q) \vee \sim(P \vee Q))$
 $\equiv \sim(\sim(P \vee Q))$
 $P \vee Q \equiv P \vee Q$ ✓

