112-1 Discrete Mathematics Charpter 1-1

姓名：許嘉隆　　學號：412770116

2.

a) Is not a proposition.
b) Is not a proposition.
c) Is a proposition, with the truth value False.
d) Is NOT a proposition, as its truth value Unknown.
e) Is a proposition, with the truth value False.
f) Is NOT a proposition, as its truth value Unknown.

12. p = "The election is decided" , q = "The votes have been counted"

a) The election isn't decided.
b) The election is decided or the votes have been counted.
c) The election isn't decided and the votes have been counted.
d) If the votes have been counted, the election is decided.
e) If the votes haven't been counted, the election isn't decided.
f) If the election isn't decided, the votes haven't been counted.
g) The election is decided if and only if the votes have been counted.
h) The votes haven't been counted or the election isn't decided and the votes haven't been counted.

22.

a) It is an inclusive or, because I can experience with both of these lauguages.
b) It is an exclusive or, because I can only choose one for lunch.
c) It is an inclusive or, because I can enter the country with both of these cards.
d) It is an inclusive or, because maybe something can publish and perish.

34.

p	q	$-p$	$-q$	$p \wedge q$	$p \vee q$	$q \rightarrow -p$	$p \leftrightarrow q$	$(q \rightarrow -p) \leftrightarrow (p \leftrightarrow q)$	$p \rightarrow -p$	$-p \rightarrow p$	$p \leftrightarrow -p$
T	T	F	F	T	T	F	T	F	F	T	F
T	F	F	T	F	T	T	F	F	T	F	F
F	T	T	F	F	T	T	F	F			
F	F	T	T	F	F	T	T	T			

$p \leftrightarrow -q$	$(p \leftrightarrow q) \oplus (p \leftrightarrow -q)$	$p \oplus (p \vee q)$	$(p \wedge q) \rightarrow (p \vee q)$
F	T	F	T
T	T	F	T
T	T	T	T
F	T	F	T

37.

p	q	$-p$	$-q$	$p \to q$	$p \to -q$	$-p \to q$	$p \leftrightarrow q$	$-p \leftrightarrow q$	$-p \leftrightarrow -q$	$(p \to q) \vee (-p \to q)$
T	T	F	F	T	F	T	T	F	T	T
T	F	F	T	F	T	T	F	T	F	T
F	T	T	F	T	T	T	F	T	F	T
F	F	T	T	T	T	F	T	F	T	T

$(p \to q) \wedge (-p \to q)$	$(p \leftrightarrow q) \vee (-p \leftrightarrow q)$	$(-p \leftrightarrow -q) \leftrightarrow (p \leftrightarrow q)$
T	T	T
F	T	T
T	T	T
F	T	T

38.

p	q	r	$-r$	$p \vee q$	$p \wedge q$	$(p \vee q) \vee r$	$(p \vee q) \wedge r$	$(p \wedge q) \vee r$	$(p \wedge q) \wedge r$	$(p \vee q) \wedge -r$	$(p \wedge q) \vee -r$
T	T	T	F	T	T	T	T	T	T	F	T
T	T	F	T	T	T	T	F	T	F	T	T
T	F	T	F	T	F	T	T	T	F	F	F
T	F	F	T	T	F	T	F	F	F	T	T
F	T	T	F	T	F	T	T	T	F	F	F
F	T	F	T	T	F	T	F	F	F	T	T
F	F	T	F	F	F	T	F	T	F	F	F
F	F	F	T	F	F	F	F	F	F	F	T

48. a) $11000 \wedge (01011 \vee 11011) = 11000 \wedge 11011 = 11000$

b) $(01111 \wedge 10101) \vee 01000 = 00101 \vee 01000 = 01101$

c) $(01010 \oplus 11011) \oplus 01000 = 10001 \oplus 01000 = 11001$

d) $(11011 \vee 01010) \wedge (10001 \vee 11011) = 11011 \wedge 11011 = 11011$