Logic Tutorial 2 Solutions

1) a.

i)	False	*A sees B* is false, and *B sees C* is true. *False* $\leftrightarrow$ *True* is False.
ii)	True	*B next-to D* is True. *True* $\vee$ *anything* is True.
iii)	True	*F above A* is False. *anything* $\wedge$ *False* is False, and $\neg$ *(False)* is True.
iv)	True	*A sees E* is False. So $\neg$*[A sees E]* is True, and *anything* $\rightarrow$ *True* is True.
v)	True	Consider $\neg$([B above E] $\leftrightarrow$ [B next-to C]). This is $\neg$(True$\leftrightarrow$ False) which is $\neg$(False) which is True.

b. The following is an example:

A	B	D
F	C	
		E

2.

a. Contingency

P	Q	P$\vee$Q	P$\wedge$(P$\vee$Q)
T	T	T	T
T	F	T	T
F	T	T	F
F	F	F	F

b. Contingency

P	Q	P$\vee$Q	P$\rightarrow$Q	(P$\vee$Q)$\wedge$(P$\rightarrow$Q)
T	T	T	T	T
T	F	T	F	F
F	T	T	T	T
F	F	F	T	F

c. Inconsistency

P	Q	$\neg P$	$Q \rightarrow P$	$P \vee (Q \rightarrow P)$	$Q \wedge \neg P$	Given wff c.
T	T	F	T	T	F	F
T	F	F	T	T	F	F
F	T	T	F	F	T	F
F	F	T	T	T	F	F

d. Tautology

P	Q	$Q \vee P$	$P \wedge (Q \vee P)$	$P \wedge (Q \vee P) \leftrightarrow P$
T	T	T	T	T
T	F	T	T	T
F	T	T	F	T
F	F	F	F	T

e. Tautology

P	Q	$P \rightarrow Q$	$\neg P$	$\neg P \vee Q$	Given wff in e.
T	T	T	F	T	T
T	F	F	F	F	T
F	T	T	T	T	T
F	F	T	T	T	T

f. Tautology – I leave the details to you!