Tutorial ...

Name:_____

ID:_____

Mathematics 1E2 2006–07

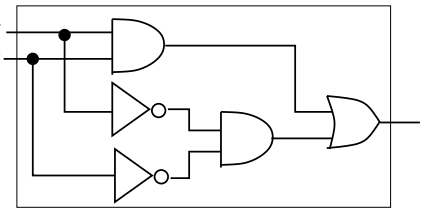
HW 15 Due 26/2/07

(1)(12 marks) Show by tables that (i) $X \implies Y$ and $Y \implies X$ are not equivalent, but (ii) $X \implies Y$ and $(\neg Y) \implies (\neg X)$ are equivalent.

(2)(8 marks) Complete the truth-table for circuit (i) below.

X	Y	$f(X,Y)$
0	0	
0	1	
1	0	
1	1	

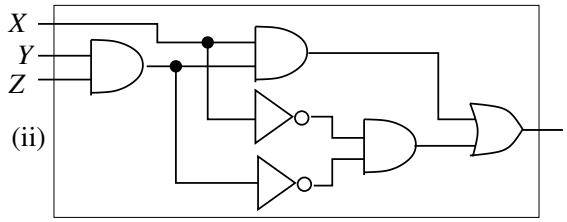
(i)



(3) (16 marks) and for circuit (ii):

X	Y	Z	$f(X,Y,Z)$
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

(ii)



(4)(14 marks) Construct an expression, using only $\implies$ and $\neg$, which realises the function computed by circuit (ii) above. **Show the construction in steps; otherwise it can't be followed.**