SIT111 – Task 3.2C The ALU Truth Table

a.

OUT (111010)		X		Y
f (x, y) = -1	0001 (1)		0011 (3)	
set x to zero	0000			
don't negate x	0000			
set y to zero			0000	
don't negate y			0000	
add x and y	0000			
negate result	1111 (-1)			

Final output: - 1111 (-1)

b.

OUT (001101)		X		Y
f (x, y) =! x	1010 (-6)		0011 (3)	
set x to zero	1010			
negate x	1010			
set y to zero			0011	
negate y			0011	
add x and y				
negate result	0101			

Final output: - 0101 (5)

c.

OUT (011111)		X		Y
f (x, y) = x + 1	1011 (-5)		0001 (1)	
set x to zero	1011			
negate x	0100			
set y to zero			0000	
don't negate y			0000	
add x and y	0100 + 1			
Don't negate result	1100			

Final output – 1100 (-4)

d.

OUT (000010)		X		Y
f (x, y) = x + y	1011		0101	
set x to zero	1011			
don't negate x	1011			
set y to zero			0101	
don't negate y			0101	
add x and y	10000			
Don't negate result	10000			

Final output - 10000 (16)

e.

OUT (000000)		X		Y
f (x, y) = x & y	1011		1001	
set x to zero	0000			
negate x	0000			
set y to zero			0000	
negate y			0000	
add x and y	0000			
Don't negate result	0000			
X AND y	1001			

Final output – 1001 (-1)