Introduction to Logic: Worksheet 3

1. Which derivation rules are used in the following derivations? Specify the appropriate justifications.

a)

1	A & B	
2	B	
3	A	

b)

1	D	
2	(D ∨ E) ≡ F	
3	D ∨ E	
4	F	

c)

1	P ⊃ ~ Q		
2	Q		
3		P	
4		Q	
5		~ Q	
6	~ P		

d)

1	S ⊃ ~ U						
2	R ∨ U						
3	R ⊃ (S & T)						
4		S					
5			U				
6				~ R			
7				U			
8				~ U			
9			R				
10			R				
11			R				
12		R					
13		R					
14		S & T					
15		S					
16	S ≡ R						

21 marks

2. Derive the following SL sentences from the specified assumptions. Specify the appropriate justifications.

a) '~ ~ A' from 'A'.
b) 'P ⊃ (Q ⊃ R)' from '(P & Q) ⊃ R'
c) 'D' from '(B ∨ C) ≡ (B ≡ D)' and 'B'
d) 'A ⊃ B' from '~ A ∨ B'
e) 'S ≡ T' from '(S ∨ U) ⊃ T' and 'T ⊃ S'

29 marks