1. (a) Complete the truth table shown below.

p	q	$p \wedge q$	$p \vee (p \wedge q)$	$(p \vee (p \wedge q)) \Rightarrow p$
T	T			
T	F			
F	T			
F	F			

(3)

(b) State whether the compound proposition $(p \vee (p \wedge q)) \Rightarrow p$ is a contradiction, a tautology or neither.

(1)

Consider the following propositions.

p: Feng finishes his homework
q: Feng goes to the football match

(c) Write in symbolic form the following proposition.

If Feng does not go to the football match then Feng finishes his homework.

(2)
(Total 6 marks)

2. Consider the two propositions p and q.

p: The sun is shining q: I will go swimming

Write in words the compound propositions

(a) $p \Rightarrow q$;

(2)

(b) $\neg p \vee q$.

(2)

The truth table for these compound propositions is given below.

p	q	$p \Rightarrow q$	$\neg p$	$\neg p \vee q$
T	T	T		T
T	F	F		F
F	T	T		T
F	F	T		T

(c) Complete the column for $\neg p$.

(1)

(d) State the relationship between the compound propositions $p \Rightarrow q$ and $\neg p \vee q$.

(1)
(Total 6 marks)

3. (a) (i) Complete the truth table below.

p	q	$p \wedge q$	$\neg(p \wedge q)$	$\neg p$	$\neg q$	$\neg p \vee \neg q$
T	T			F	F	
T	F			F	T	
F	T			T	F	
F	F			T	T	

(ii) State whether the compound propositions $\neg(p \wedge q)$ and $\neg p \vee \neg q$ are equivalent.

(4)

Consider the following propositions.

p: Amy eats sweets
q: Amy goes swimming.

(b) Write, in symbolic form, the following proposition.

Amy either eats sweets or goes swimming, but not both.

(2)
(Total 6 marks)