1. Three propositions are given as

p: It is snowing q: The roads are open r: We will go skiing

(a) Write the following compound statement in symbolic form.

"It is snowing and the roads are not open."

(2)

(b) Write the following compound statement in words.

$$(\neg p \wedge q) \Rightarrow r$$

(3)

An incomplete truth table for the compound proposition $(\neg p \wedge q) \Rightarrow r$ is given below.

(c) Copy and complete the truth table **on your answer paper**.

p	q	r	$\neg p$	$\neg p \wedge q$	$(\neg p \wedge q) \Rightarrow r$
T	T	T			
T	T	F			
T	F	T			
T	F	F			
F	T	T			
F	T	F			
F	F	T			
F	F	F			

(3)
(Total 8 marks)

2. Complete the Truth Table for the compound proposition $(p \wedge \neg q) \Rightarrow (p \vee q)$.

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

(Total 8 marks)

3. Consider two propositions p and q. Complete the truth table below for the compound proposition.

$(p \wedge \neg q) \Rightarrow (\neg p \vee q)$

p	q	$\neg p$	$\neg q$	$p \wedge \neg q$	$\neg p \vee q$	$(p \wedge \neg q) \Rightarrow (\neg p \vee q)$
T	T	F	F	F	**(d)**	T
T	F	F	T	**(b)**	F	**(f)**
F	T	**(a)**	F	**(c)**	T	**(g)**
F	F	T	T	F	**(e)**	**(h)**

(Total 8 marks)

4. Consider the following statements.

p: students work hard
q: students will succeed

(a) Write the following proposition in symbols using p, q and logical connectives only.

If students do not work hard, then they will not succeed.

(b) Complete the following truth table, relating to the statement made in part (a), and decide whether the statement is logically valid.

p	q			
T	T			
T	F			
F	T			
F	F			

(Total 8 marks)

5. Two propositions p and q are defined as follows.

p: Jones passed this course
q: Smith passed this course

(a) Write in symbolic form

(i) *neither Jones nor Smith passed the course*;

(ii) *it is not the case that Jones and Smith both passed the course.*

(b) Complete the following truth table for the logic statement $\neg p \vee q$.

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

(Total 4 marks)