1. (a) Complete the following truth table.

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

(2)

Consider the propositions

p: Cristina understands logic
q: Cristina will do well on the logic test.

(b) Write down the following compound proposition in symbolic form.

"If Cristina understands logic then she will do well on the logic test"

(2)

(c) Write down in words the contrapositive of the proposition given in part (b).

(2)
(Total 6 marks)

2. Consider the statement *p*:

"If a quadrilateral is a square then the four sides of the quadrilateral are equal".

(a) Write down the inverse of statement *p* in words.

(2)

(b) Write down the converse of statement *p* in words.

(2)

(c) Determine whether the converse of statement *p* is always true. Give an example to justify your answer.

(2)
(Total 6 marks)

3. Consider the following logic statements:

p: x is a factor of 6

q: x is a factor of 24

(a) Write $p \Rightarrow q$ in words.

(1)

(b) Write the converse of $p \Rightarrow q$.

(1)

(c) State if the converse is true or false and give an example to justify your answer.

(2)

(Total 4 marks)

4. Consider the statement *"If a figure is a square, then it is a rhombus"*.

(a) For this statement, write in words

(i) its converse;

(ii) its inverse;

(iii) its contrapositive.

(b) Only one of the statements in part(a) is true. Which one is it?

(Total 8 marks)

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

p: the number ends in zero

q: *the number is divisible by 5*

(a) Write in words

(i) $p \Rightarrow q$;

(ii) the converse of $(p \Rightarrow q)$.

(b) Write in symbolic form

(i) the inverse of $(p \Rightarrow q)$;

(ii) the contrapositive of $(p \Rightarrow q)$.

(Total 4 marks)