Practical 6

Logic Gates and Adders

Part A

Objective

Understand various logic gates

1. Complete questions below

A

Draw a transistor level circuit diagram and truth table for a **OR Gate** which consists of **NOR** and **NOT** gates

(5 marks)

B

Draw a transistor level circuit diagram and truth table for a **XOR Gate** which consists of **NAND** and **OR** gates

(6 marks)

C

Draw a transistor level circuit diagram and truth table for a **AND Gate** which consists of **NAND** and **NOT** gates

(5 marks)

D

De Morgan's Law can be expressed as "the negation of a conjunction is the disjunction of the negations" and that "the negation of a disjunction is the conjunction of the negations". Prove, using a truth table, that:

$$\neg(A \wedge B) = \neg A \vee \neg B$$

(14 marks)

E

Draw a logic Gate diagram for De Morgan's Law.

F

Draw a Transistor Gate diagram for De Morgan's Law. Why is this an important law.

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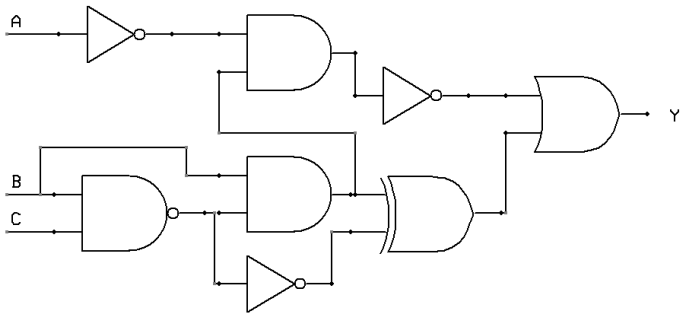
2. Complete questions below

Using logic.ly construct the following Circuit using NAND and NOT Gates (With a Light at Output) and complete Truth Tables

A	B	C	Y
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	



Hand up this practical report at the end of session and ensure it has been checked

Student Name		**Student Number**	
Date		**Checked**	
Group	**A / B**		