

Task

by Bismark Agyapong

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Introduction to Digital Electronics -



ACDA4016

Coursework

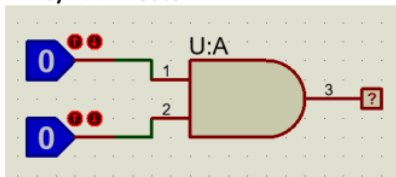
Name: Bismark Agyapong

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Task 1

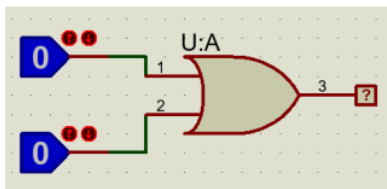
a) AND Gate



Truth Table

Input		Output
A	B	$Y=A.B$
0	0	0
0	1	0
1	0	0
1	1	1

b) OR Gate

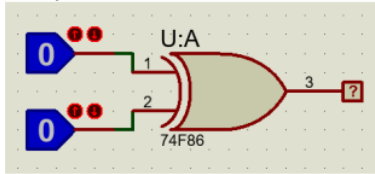


Truth Table

Input		Output
A	B	$Y=A+B$
0	0	0
0	1	1
1	0	1

1	1	1
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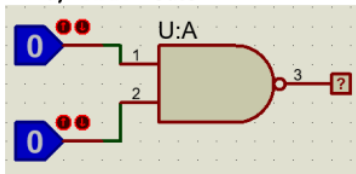
c) Exclusive -OR Gate



Truth Table

Input		Output
A	B	$Y = A \oplus B$
0	0	1
0	1	0
1	0	0
1	1	0

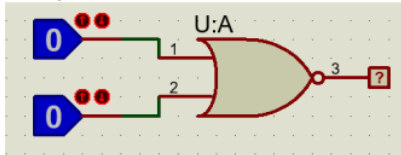
d) NAND Gate



Truth Table

Input		Output
A	B	$Y = A \cdot B$
0	0	1
0	1	1
1	0	1
1	1	0

e) NOR Gate



Truth Table:

Input		Output
A	B	$Y=A+B$
0	0	1
0	1	0
1	0	0
1	1	0

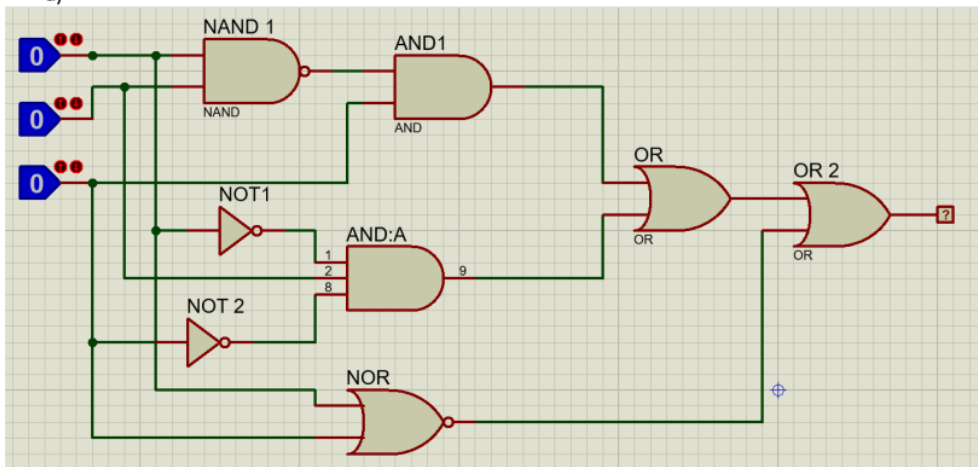
Task 2

Design a logic circuit using a software for the following equations

a) $Y = (\overline{AB})C + \overline{A}B\overline{C} + \overline{A} + \overline{C}$

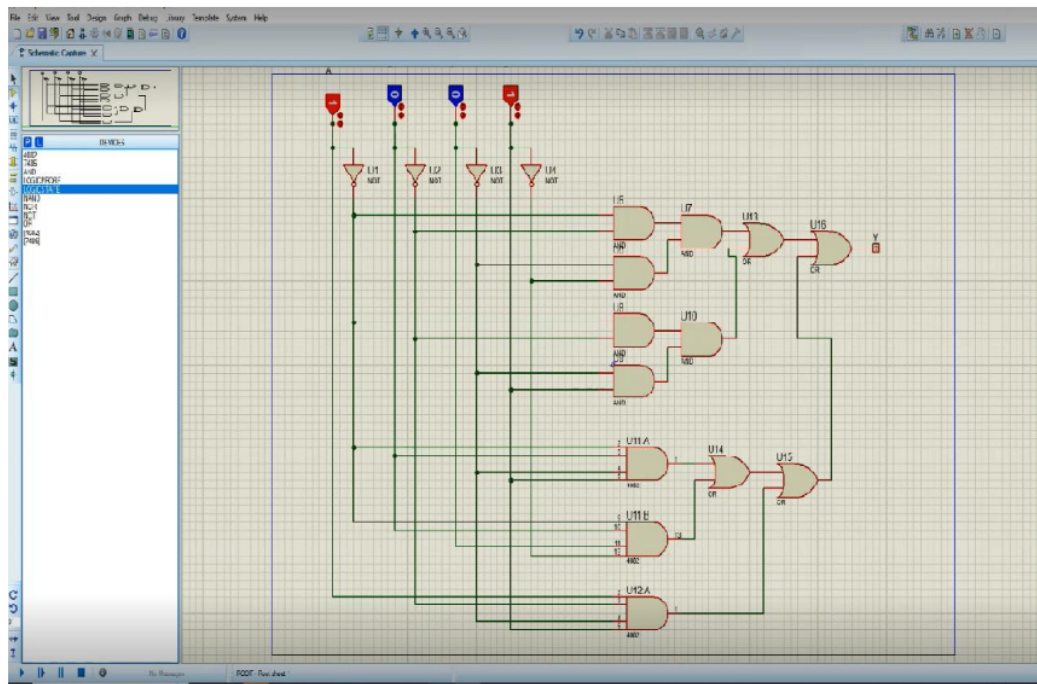
b) $Y(A, B, C, D) = \sum_m(0, 1, 5, 6, 9)$

a)



b)



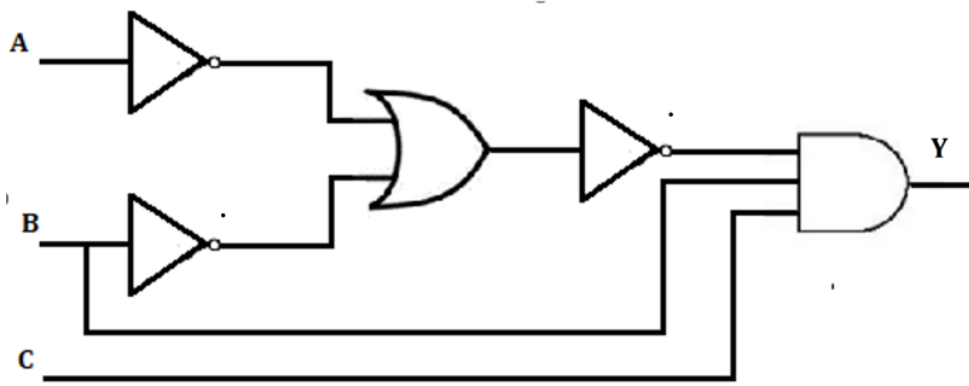


3.

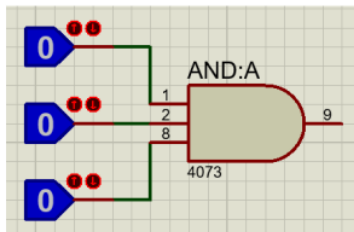
Task 3



3. Determine the Boolean expression for the circuit shown below. Simplify the Boolean expression and design circuit for the simplified equation using the software. Draw the truth table for the same.



Truth Table



Inputs	Outputs		
	A	B	C
0	0	0	0

0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

Task 5 . 8

Describe the types and applications of Sequential Circuits

There are two types of sequential circuit, synchronous and asynchronous. Synchronous types use pulsed or level inputs and a clock input to drive the circuit (with restrictions on pulse width and circuit propagation). Asynchronous sequential circuits do not use a clock signal as synchronous circuits do.

The basic classification of sequential circuits is event-driven, pulse driven, and clock-driven.

Applications of Sequential Circuits

- Shift registers.
- Flip flops.
- Analog to digital and digital to analog converters.
- Counters.
- Clocks.
- Used as registers inside microprocessors and controllers to store temporary information.
- Applied in programmable devices such as CPLD, PLD, and FPGA.



FINAL GRADE

55/100

GENERAL COMMENTS

Instructor

Engagement with Literature Skills: Marks: 0/0

Knowledge and Understanding Skills: Marks: 18/25

It is evident that there is good knowledge and understanding of the basic underlying concepts and principles of the subject. However the tasks 4 has not been answered.

Cognitive and Intellectual Skills: Marks: 10/25

Limited attempt at evaluation of the underlying concepts and principles. Weak interpretation of data. Truth table is provided for task 1, and task 3. Brief description about the findings is lagging in Task 1, Task 2 and Task 3.

Practical Application Skills: Marks : 25/45

A good and appropriate application of basic methods and tools in Electronics is evident. Designing logic circuits for a set of equations is evident through Task 2 and Task 3. However the screen grabs of the outputs for various input combinations are not provided in the assignment.

Transferable Skills for Life and Professional Practice: Marks : 2/5

Work is poorly presented in a disjointed manner. It is loosely and at times incoherently structured. Information and ideas provided needs improvement.

Overall Total: 55/100



Comment 1

Task 1: 16/20

Task 2: 22/30

Task 3: 10/20

Task 4: 0/20

Task 5: 7/10

Total: 55/100



Comment 2

Title Page is good

PAGE 2



Comment 3

It would have been better if Table of content is added.



Comment 4

Good Work, Design of various logic gates and the truth table for each gate is good. It would have been better if a brief description is added.

Task 1: 16/20

PAGE 3

PAGE 4



Comment 5

Good Attempt, the design part is good. It is evident, that you can design circuits using software,. It is better to have outputs in the circuit screen sort and a brief description about the background of the design.

Task 2: 22/30



Comment 6

It would have been better if figure is name and numbered.

PAGE 5

PAGE 6



Comment 7

The simplified Boolean expression is correct. The truth table is also correct. The output for the simplified circuit is correct. It would have been better to have the obtained Boolean expression from the circuit and the simplification process.

Task 3: 10/20

PAGE 7



Comment 8

Good Description, The different types of sequential circuits, and the applications of sequential circuits are mentioned. However, it is better to describe with necessary diagrams and references.

Task 5: 7/10



Comment 9

Reference is missing, It is better to have reference.