

Digital Electronic

by Mohammed Taher

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1

2

Student name: MOHAMMED TAHER; STUDENT NUMBER: 2206965

Tasks:

4

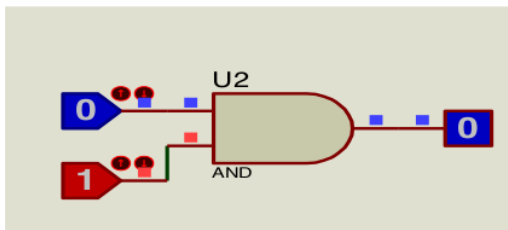
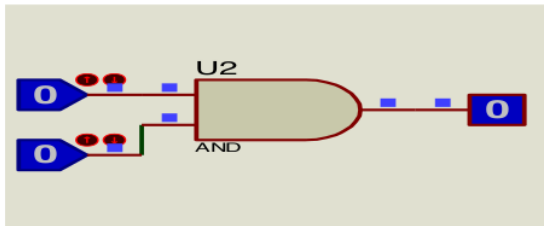
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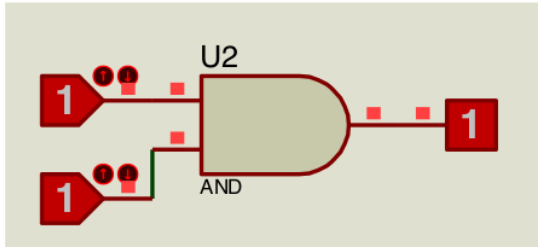
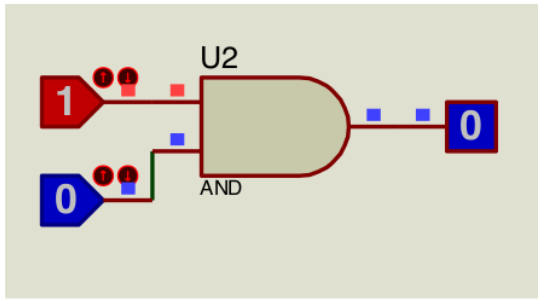
1. Generate the Logic symbols and truth tables for the following :

- a) An AND gate.
- b) A OR gate.
- c) A XOR gate.
- d) A NAND gate.
- e) A NOR gate.

And gate

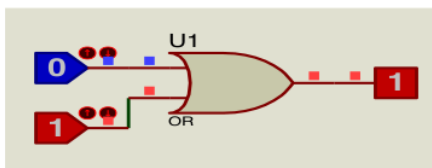
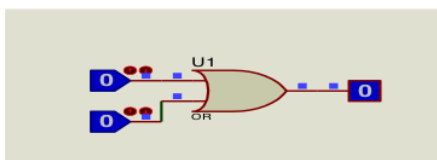
input		output
A	B	$Y = A.B$
0	0	0
0	1	0
1	0	0
1	1	1

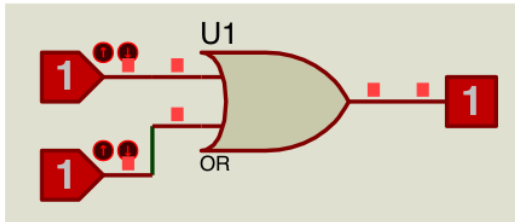
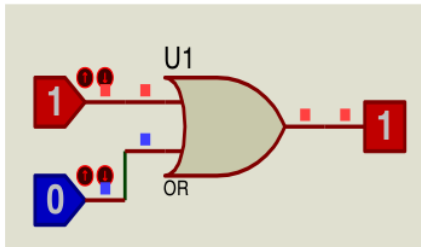




Or gate

input		output
A	B	$Y = A.B$
0	0	0
0	1	1
1	0	1
1	1	1

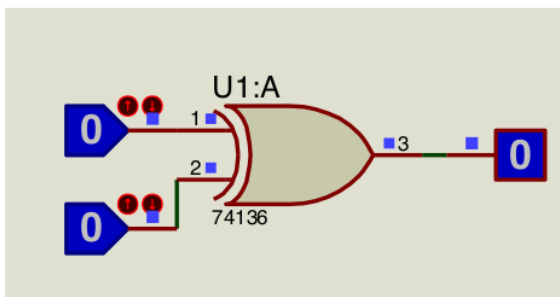




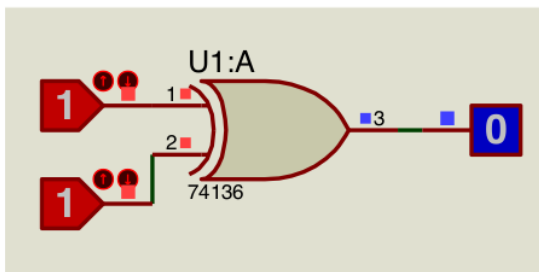
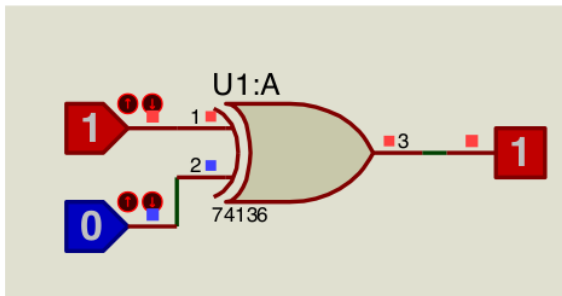
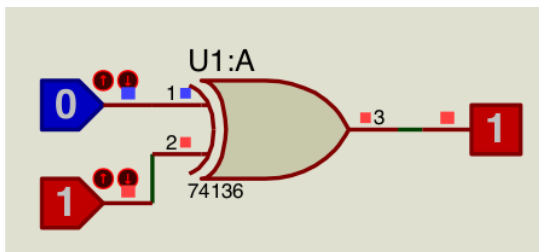
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X or gate

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

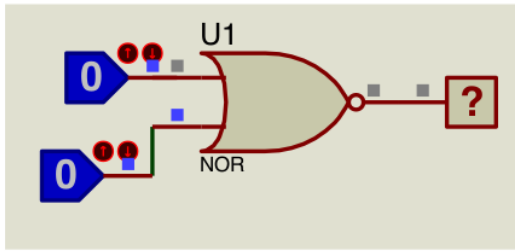


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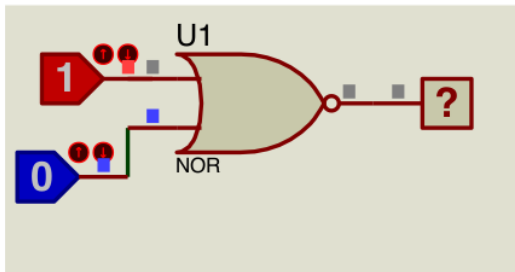
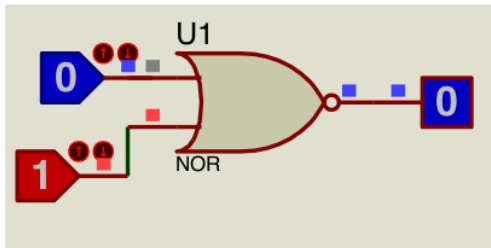
Nor gate

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

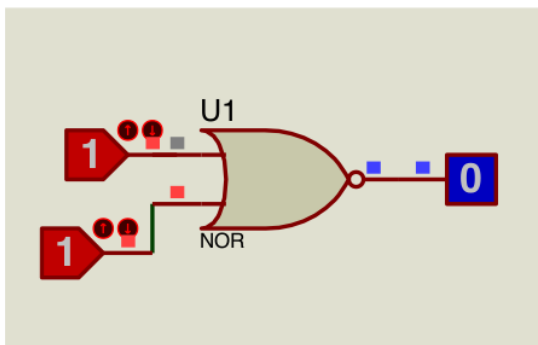


it's =1

in this one does not give an answer to output and

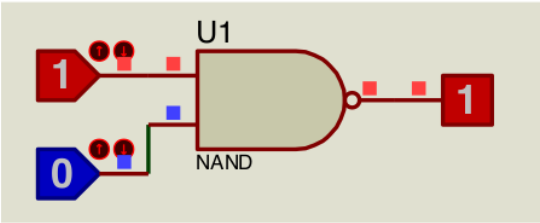
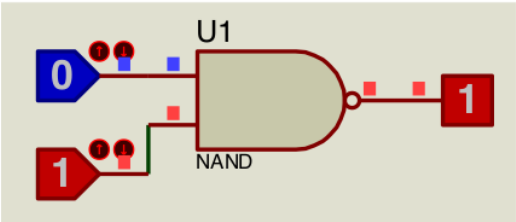
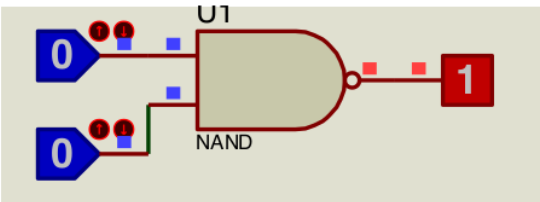


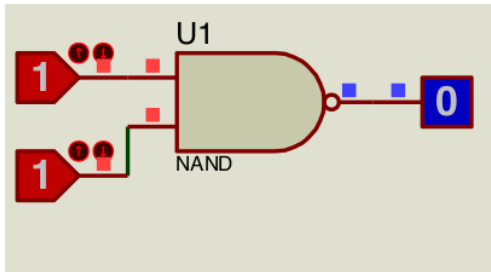
output is = 0



Nand Gate

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



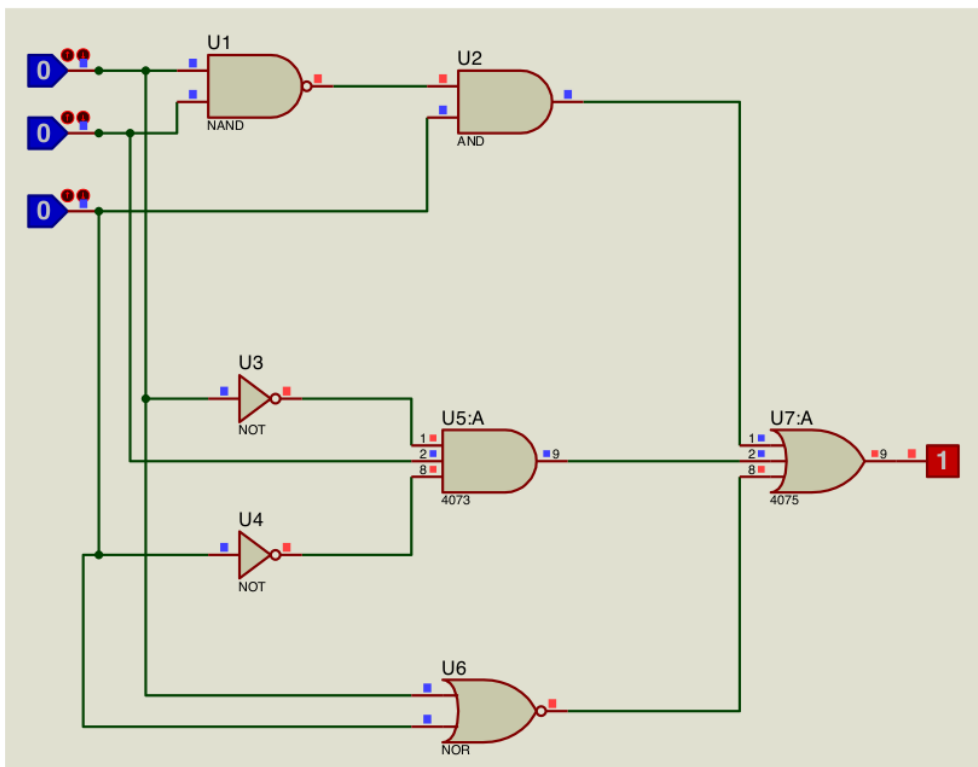


Test 2

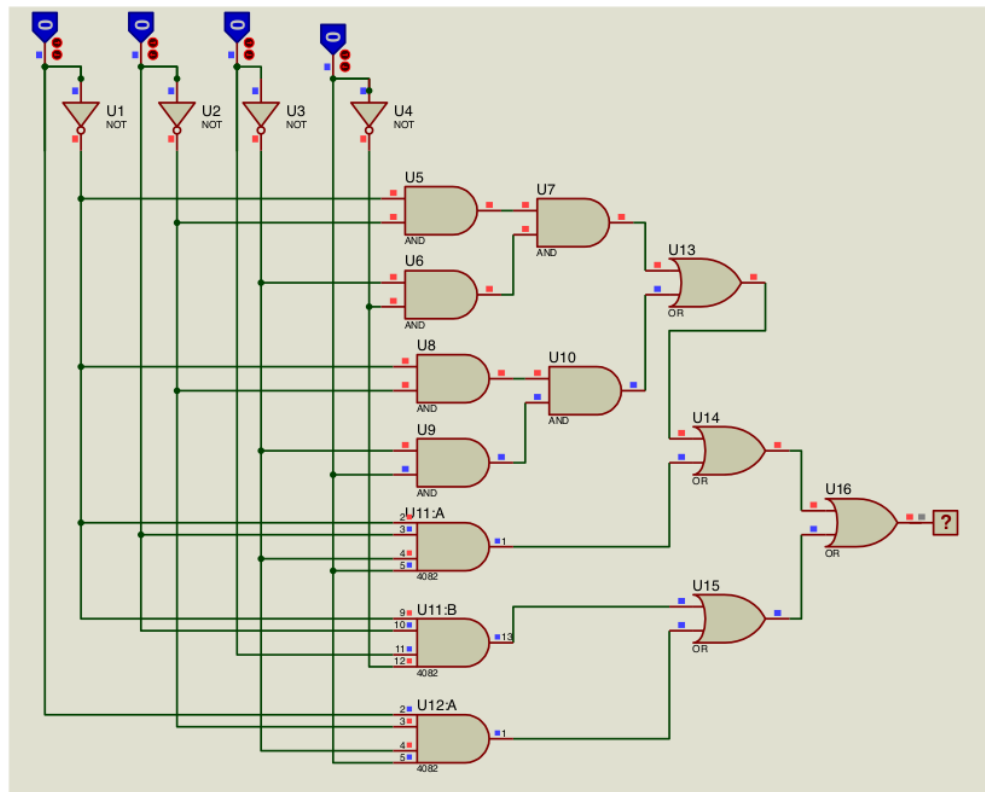


2. Design a logic circuit using a software for the following equations.

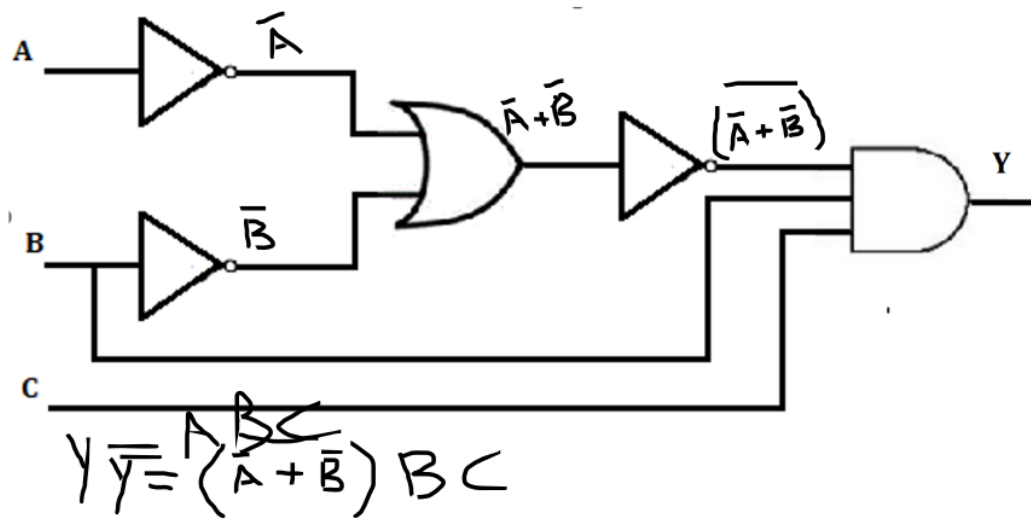
a) $Y = (\overline{AB})C + \overline{A}BC + \overline{A} + C$



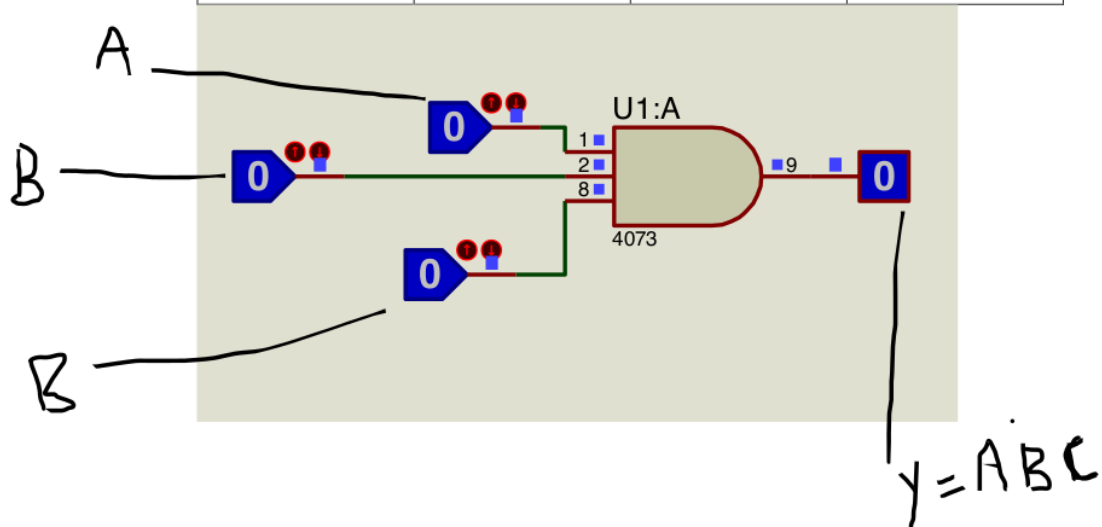
b). $Y(A, B, C, D) = \sum_m(0, 1, 5, 6, 9)$

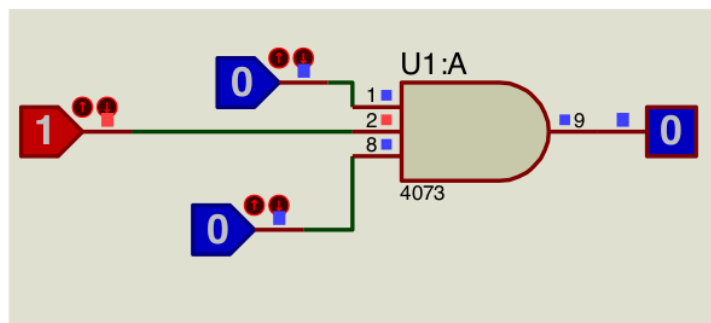
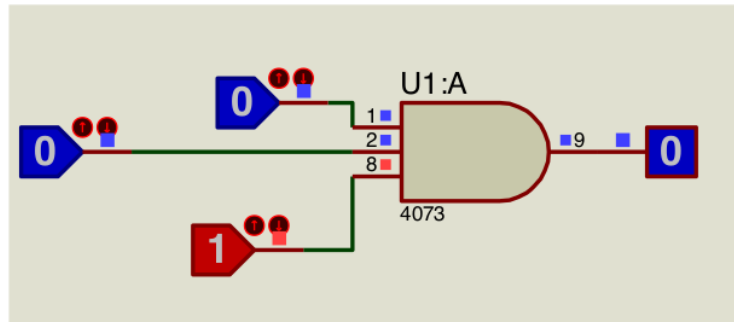


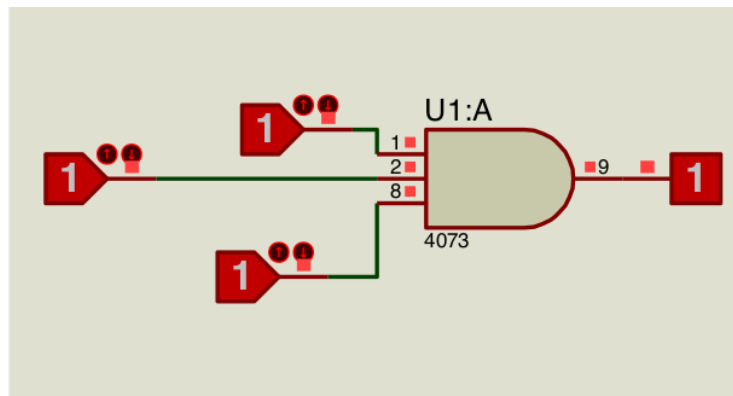
3.  Determine the Boolean expression for the circuit shown below. Simplify the Boolean expression and design circuit for the simplified equation using the software. Draw the truth table for the same.



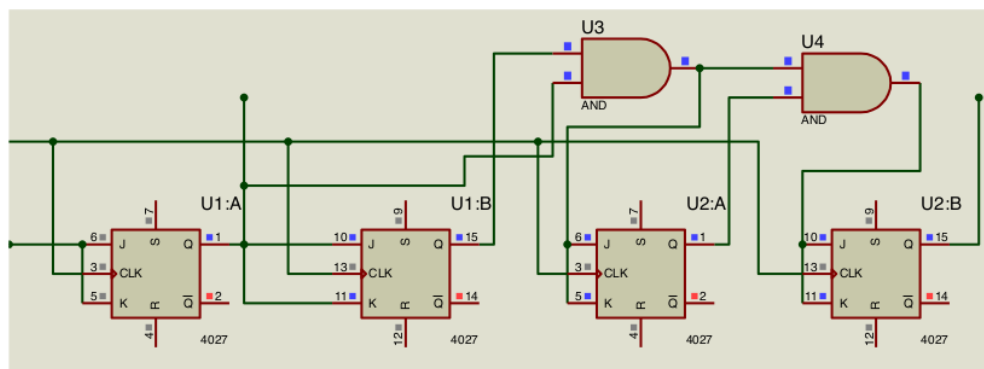
Inputs			output
A	B	C	$Y = ABC$
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1







4) Design a 4 bit Synchronous counter circuit using Porteous software.
 Draw truth table for the input and outputs.



clock	state	U 2B	U2 A	U1 B	U1 A
1	0	0	0	0	0
2	1	0	0	0	1
3	2	0	0	1	0
4	3	0	0	1	1
5	4	0	1	0	0
6	5	0	1	0	1
7	6	0	1	1	0
8	7	0	1	1	1

9	8	1	0	0	0
10	9	1	0	0	1
11	10	1	0	1	0
12	11	1	0	1	1
13	12	1	1	0	0
14	13	1	1	0	1
15	14	1	1	1	0
16	15	1	1	1	1
17	0	0	0	0	0

5.  10 Describe the types and applications of Sequential Circuits.

Sequential circuits are digital circuits that use memory elements to store data and are used in digital systems for various applications. The extensive application of sequential logic circuits shifts registers, flip flops, analog to digital and digital to analog converters, counters, clocks, and programmable devices such as CPLD, PLD and FPGA. Sequential circuits are classified into two types: Finite state machines (FSMs) and Synchronous sequential circuits.

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FINAL GRADE

71 / 100

GENERAL COMMENTS

Instructor

Engagement with Literature Skills: Marks: 0/0

Knowledge and Understanding Skills: Marks: 19/25

It is evident through task 1 to 5, there is good knowledge and understanding of the basic underlying concepts and principles of the Digital Electronics Module. Each input combinations and their outputs for task 1 and task3 were provided as screenshot, but not provided for task 2 and 4.

Cognitive and Intellectual Skills: Marks: 18/25

Good evaluation of the underlaying concepts and principles is evident through the truth tables provided. However, it is better to have a brief evaluation report for each task, which is lagging in task 1 to 4.

Practical Application Skills: Marks : 32/45

A very good understanding and knowledge to apply the suitable tools in Digital Electronics module is evident. Logic circuits has been designed for set of tasks from 1 to 4. The screenshot of the outputs for various input combinations are provided for task 1 and task 3

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

Work is properly presented with a continuation in flow of information. Needs improvement in preparing the report, as the report should be well structured and properly aligned to the assignment guidelines. The title page, table of content, figure numbers, names, table name and numbers were not provided in the report.



Comment 1

Task 1: 18/20

Task 2: 22/30

Task 3: 15/20

Task 4: 14/20

Task 5: 2/10

Total: 71/100



Comment 2

Good Attempt, the first page or the title page of the report should have the name, student ID, Module Name, Module code, Title of the Coursework, programme of study.



Comment 3

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



Comment 4

It could have been better if table of content is added.

PAGE 2

PAGE 3



Comment 5

It could have been better if the pictures / screen grabs are named and numbered.



Comment 6

Page number is missing

PAGE 4

PAGE 5

PAGE 6

PAGE 7



Comment 7

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



Comment 8

The simplified Boolean expression is correct. The truth table 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: 15/20



Comment 9

The design of circuit diagram is good. The truth table is also correct. However, it is better to include few description

Task 4: 14/20



Comment 10

Good Description, The different types of sequential circuits, and the applications of sequential circuits would have been explained more detailed.

Task 5: 2/10



Comment 11

It is better to have reference