



COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE

NCSC411: DATA STRUCTURES AND ALGORITHMS

END OF SEMESTER EXAMINATIONS

MAY 2021

LECTURER: DR KANDIERO.A

TIME: HOURS

INSTRUCTIONS

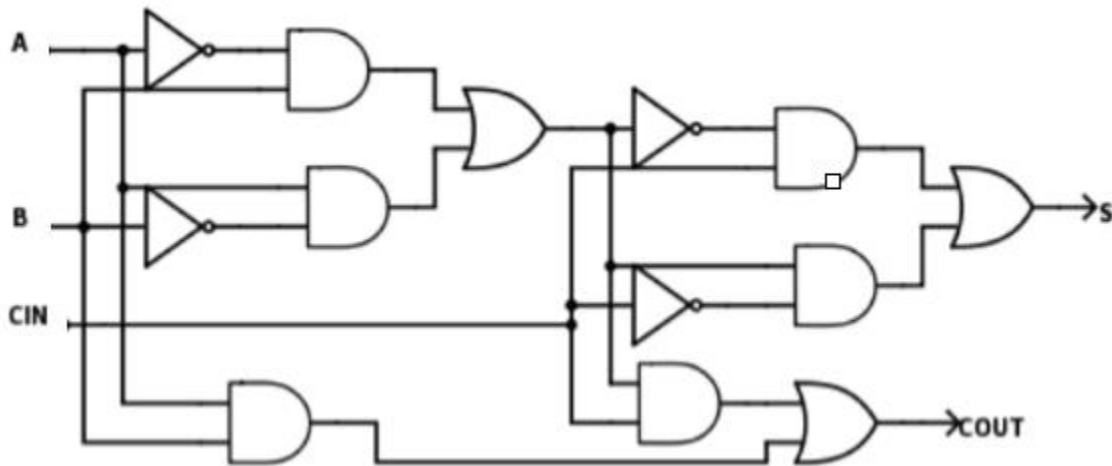
1. Answer any **ONE** question.
 2. Compile your answer into **one** consolidated PDF format document.
 3. The file naming format is **studentid_coursecode_surname**
 4. Answers to be presented in the sequence they are asked
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QUESTION 1 [100]

- Save your simulator diagrams and Zip them and send together with your PDF answer document
- Snip or make a screen shots of all your simulated drawing on a PDF answer document

(a) Using logic simulator software:

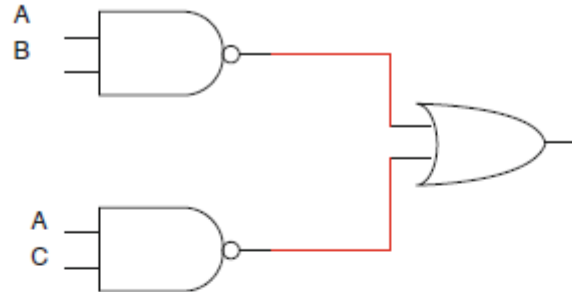
- (i) Draw and Simulate the logic diagram shown below. [20 marks]
- (ii) Simulate the truth table [10 marks]
- (iii) Determine the Boolean expression for the output **Cout** and **S**. [10 marks]



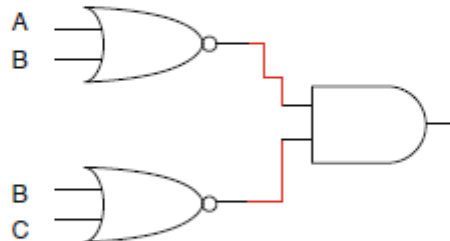
(b) Using the Logic simulator software

Draw and simulate the output of the following gates **[30 marks]**

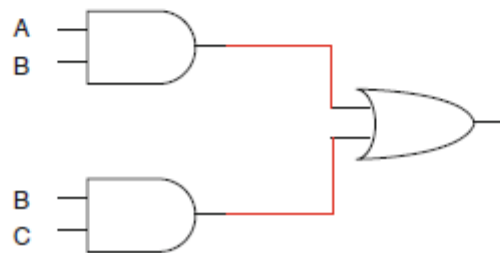
(i)



(i)



(ii)



(iii) Simulate the truth tables of the logic diagrams above **[10 marks]**

(c) Using the logic simulator Draw logic circuits for the following function. **[20 marks]**

$$\overline{XYZ} + XZ + YZ$$

Question 2 [100 Marks]

Develop a complete solution, including a data dictionary, to the following problem: The president of a college would like to know the age distribution of the students. Complete a solution using the frequency distribution technique to output the needed results.

Question 3 [100 Marks]

Develop a complete solution, including a data dictionary, to the following problem:
Create a linked list of the following data. The data will be in ascending order by temperature.

Day	Temperature
Nov. 28	33
Nov. 29	38
Nov. 30	30
Dec. 1	43
Dec. 2	48
Dec. 3	42
Dec. 4	40

END OF EXAMINATION
