COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE

NCSE115: FUNDAMENTALS OF DIGITAL ELECTRONICS

END OF SECOND SEMESTER EXAMINATIONS

MAY 2021

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TIME: 7 HOURS

INSTRUCTIONS

1. Answer any **ONE** question.
2. Compile your answer into one consolidated PDF format document.

Question 1 [100]

- Save your simulator diagrams and Zip them and send together with your PDF answer document

- Snip or make a screen shot of all your simulated drawing on a PDF answer document
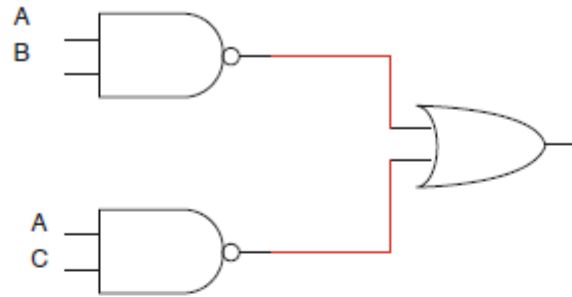
(a) Using logic simulator software:

    (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 **C out** and **S.**   **[10 marks]**
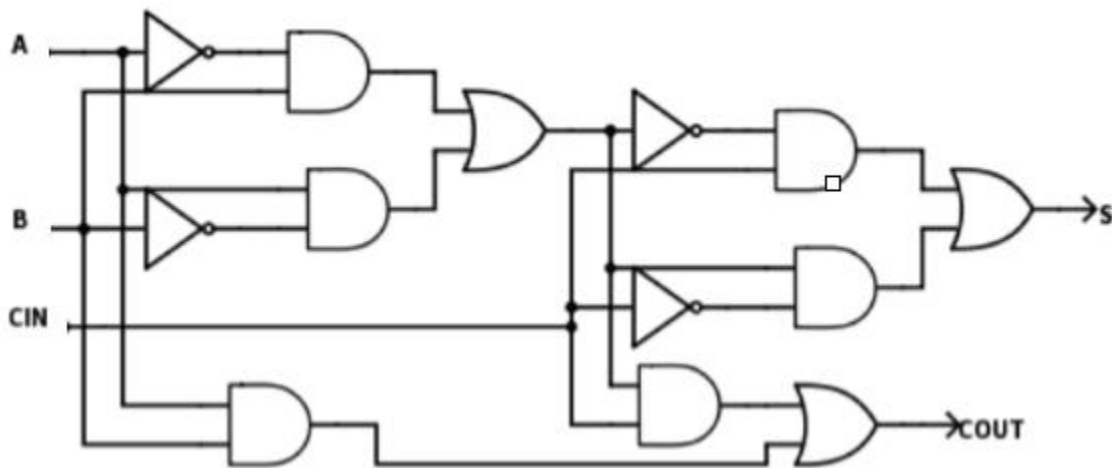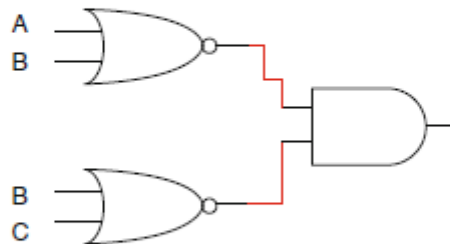
(b) Using the Logic simulator software

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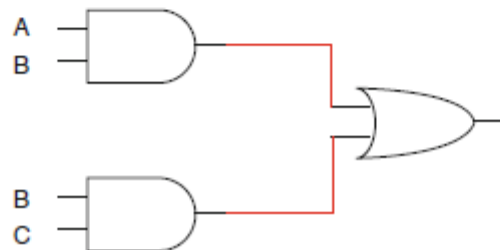
(i)

(i)

(ii)

(iii)   Simulate the truth tables of the logic diagrams above   **[10 marks]**
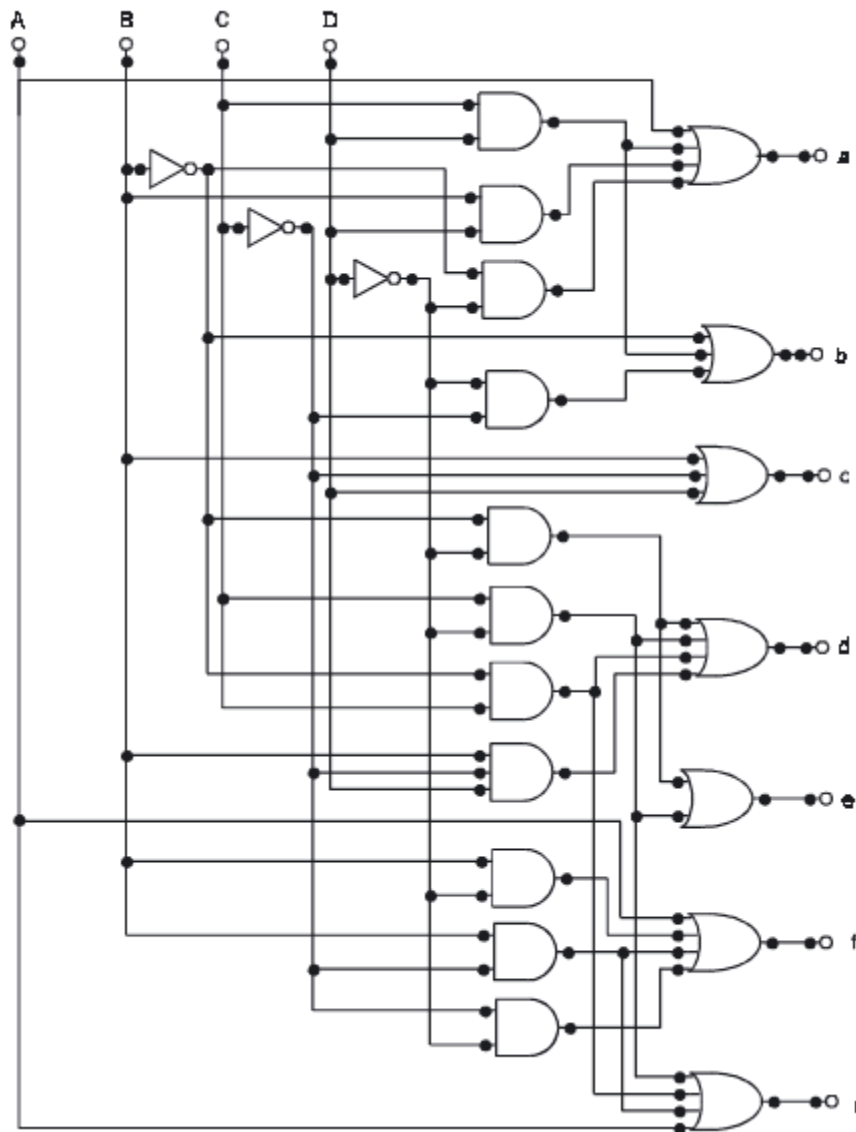
(c) Using the logic simulator Draw logic circuits for the following function. **[20 marks]**

$\overline{XYZ} + XZ + YZ$

Question 2 [100]

Snip or make a screen shots of all your simulated drawing on a PDF answer document

Study the logic diagram below

(a) Deduce the Boolean expression for outputs a,b,c,d,e,f and g.   **[30 marks]**

(b) Simulate the above logic diagram using simulator software.   **[40marks]**

(c) Simulate the truth table.   **[30 marks]**

Question 3 [100]

Snip or make a screen shot of all your simulated drawing to a PDF answer document

Study the Boolean expression shown below.

$$f = \bar{w} x \bar{y} z + \bar{w} x y \bar{z} + \bar{w} x y z + w x \bar{y} z$$

   (a) Using the logic simulator draw the logic diagram for the above Boolean expression

                                                              [30 marks]

   (b) Using the K-map method simplify the Boolean expression above.   **[30 marks]**

   (c) Hence using the logic simulator software draw the simplified logic diagram.**[40marks]**

END OF EXAMINATION

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