Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Computer Science and Technology
100 level 2nd Semester Examination – Dec. 2018 / Jan. 2019
CST161-3 Microcomputer Architecture and Logic Design

Uva Wellassa University

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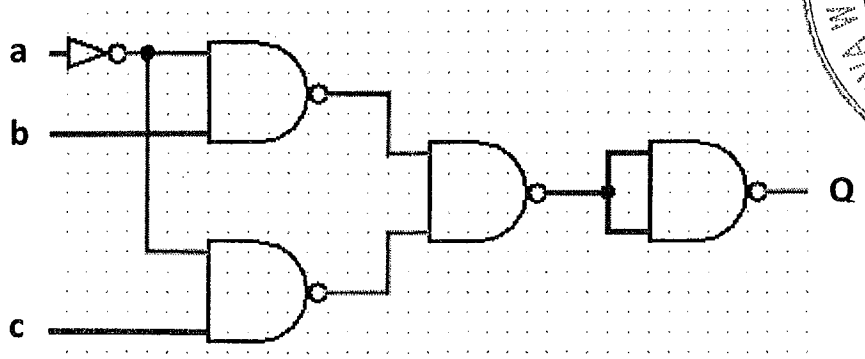
1.

a. Define the terms **Boolean expression** and **truth table.** (4 mark)

b. What are the advantages of Boolean expression simplification? (3 mark)

c. Consider the logic circuit below to answer the following questions.



i. Derive the Boolean expression and draw up the truth table for the circuit above. (4.5 mark)

ii. Simplify the Boolean expression derived in part c. i. to its simplest form using any applicable Boolean laws and theorems. (4.5 mark)

iii. Draw the circuit diagram for the simplified Boolean expression. (3 mark)

iv. Simplify the Boolean expression derived in part c. i. to its simplest form using K-map. (3.5 mark)

v. Draw up the truth table for simplified circuit and prove that the two (02) circuits are equivalent. (4 mark)

2.

a.

i. Define the term **circuit** and list the components of a circuit. (5 mark)

ii. Design a 4-bit parallel Adder and briefly describe how two (02) binary numbers 1001_2 and 0101_2 can be added to produce the output using a graphical explanation. (6 mark)

b.

i. Mention the two (02) types of sequential circuits and differentiate them. (5 mark)

ii. What is the drawback of S-R flip flop and how it is overcome by D flip flop? (4 mark)

iii. Briefly describe the memory states of S-R flip flop by providing suitable examples. (7 mark)

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3.

a. What is a microprocessor? List the three (03) types of information it can carry. (5 mark)

b. List six (06) types of instructions which can be supported by 8086 architecture? (5 mark)

c. Briefly describe the pipelining technique in 8086 architecture. (6 mark)

d. Find out the physical address of a data stored in **Data** memory where DS = 1200, IP = 124 and SI = 240. (3 mark)

e.

i. Explain the process takes place after executing the following instruction. Assume that BL = 05_H and CL = 10_H. (4 mark)

ADD BL, CL;

ii. Rewrite the above instruction to do the same function using only one (01) register. (3.5 mark)

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