Daffodil International University

Department of Computer Science & Engineering
Faculty of Science & Information Technology
Mid Term Examination Semester: Fall 2019
Course Code: CSE 212 Course Title: Digital Electronics
Section: ALL

Time: 1.5 hours **Full Marks: 25**

Answer any five from the following questions

QUESTION 1: [5.0]

a) Express the following number in 1's complement, 2's complement form and in sign magnitude form (use 8 bits): [3.0]

i. -46

ii. 120

b) Subtract 14 from 67 in 2's complement method using 16 bits. [2.0]

QUESTION 2: [5.0]

Suppose there is a chemical processing plan, a liquid chemical is used in manufacturing process. The chemical is stored in three different tanks A, B and C. A sensor in each tank produces LOW when the chemical drops at a particular point in the tank as a result an alarm P beeps or lightens.

Construct a circuit which will act according to the mentioned condition.

QUESTION 3: [5.0]

Derive the expressions of a Full adder and draw a it's circuit diagram using half adders.

QUESTION 4: [5.0]

a) Find out the corresponding SOP expression of the following POS expression:
(A+B+C)(A+B'+C'+D)(A'+B'+C'+D') [2.5]

b) Use K map to minimize the following expression:
(A+B+C)(A+B+C')(A+B'+C)(A+B'+C')(A'+B'+C) [2.5]

QUESTION 5: [5.0]

a) Prove the following theorem: (A+B)(A+C)=A+BC [2.0]

b) Minimize the following expression and draw its logic circuit:

[A'B(C+D')+E]' [3.0]

QUESTION 6: [5.0]

a) Determine the sum generated by a 3-bit Ripple Carry Adder when the given numbers are 101 and 001. Draw the circuit and show the intermediate carries. [3.0]

b) Convert the binary number 10101111 to Gray code. [1.0]

c) Add even parity to "MA" that you want to send to your brother. [1.0]