



Student ID:

EE208: Logic Design
Mid Term Exam: Part#1
Time allowed: 90 Min
1st Semester 1428H-1429H

a) Convert - (100001100100.0101011)_{BCD} to its equivalent binary code
- (9875)₃₂ to its equivalent binary code without calculator (**Bonus**)
b) Perform the following operations using 8-bit signed binary numbers and detect the overflow or underflow cases? (*hint*: use 2's complement for negative numbers)

123 - 65 = ? 37 - 78 = ?

c) Write the equivalent product of sums POS for the following function

$F(x, y, z) = \bar{x}y + yz + xz$

Answer to question 1:

Question 2:

- a) Simplify the following function using K-map and draw the circuit using **NAND** gates only
- $$F(A, B, C, D) = \sum m(0, 2, 4, 8, 10) + \sum d(3, 5, 7, 12, 14)$$
- b) Implement the above function in part (a) using only **NOR** gates.

Answer to question 2:

Question 3:

Given the logic function $F(x, y, z, w) = \sum m(0, 5, 10, 15)$

- a) Write the truth table
- b) Derive the logic function
- c) Simplify the logic function using Boolean algebra
- d) Draw the circuit using minimal number of gates

Answer to question 3: