National University of Computer and Emerging Sciences, Lahore Campus

Course:	DLD Lab	Course Code:	EL227
Program:	BS (Computer Science)	Semester:	Spring 2018
Duration:	60 minutes	Total Marks:	25
Date	26-03-18	Weight	25%
Section:	B2 (B)	Pages:	3

Mid Term Exam

NAME: _____ **Roll #:**_____

READ THE INSTRUCTIONS CAREFULLY.

1. For your ease, Pin Configurations of all ICs is given in word file named **"ICs Info"** placed in folder at **sandata/xeon/Spring2018/AbdulKhaliq/DLDSectionB2.**

2. You will be immediately **disqualified** from the exam if:

i. You are seen talking, whispering, borrowing or looking at someone's Paper.

Problem Statement: Mr James has invested a huge amount of money into buying and selling land. Before he will buy a certain land, he must get input from three sources. His first source is Jimmy, a famous property dealer. His second source is Meg, a self-made millionaire in this business, and his third source is Carl, his best friend. After several months of receiving advice from all three, he has come to the following conclusions:

A). Buy if all three say yes.

B). Buy if the Carl says yes and Meg says no.

C). Buy if both the Carl and Jimmy says no.

D). Buy if Jimmy and Meg both say yes even if the Carl says no.

E). Don't buy otherwise.

a. Draw the truth table for above problem statement. **[2 Point]**

Jim	Meg	Carl	F1
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1

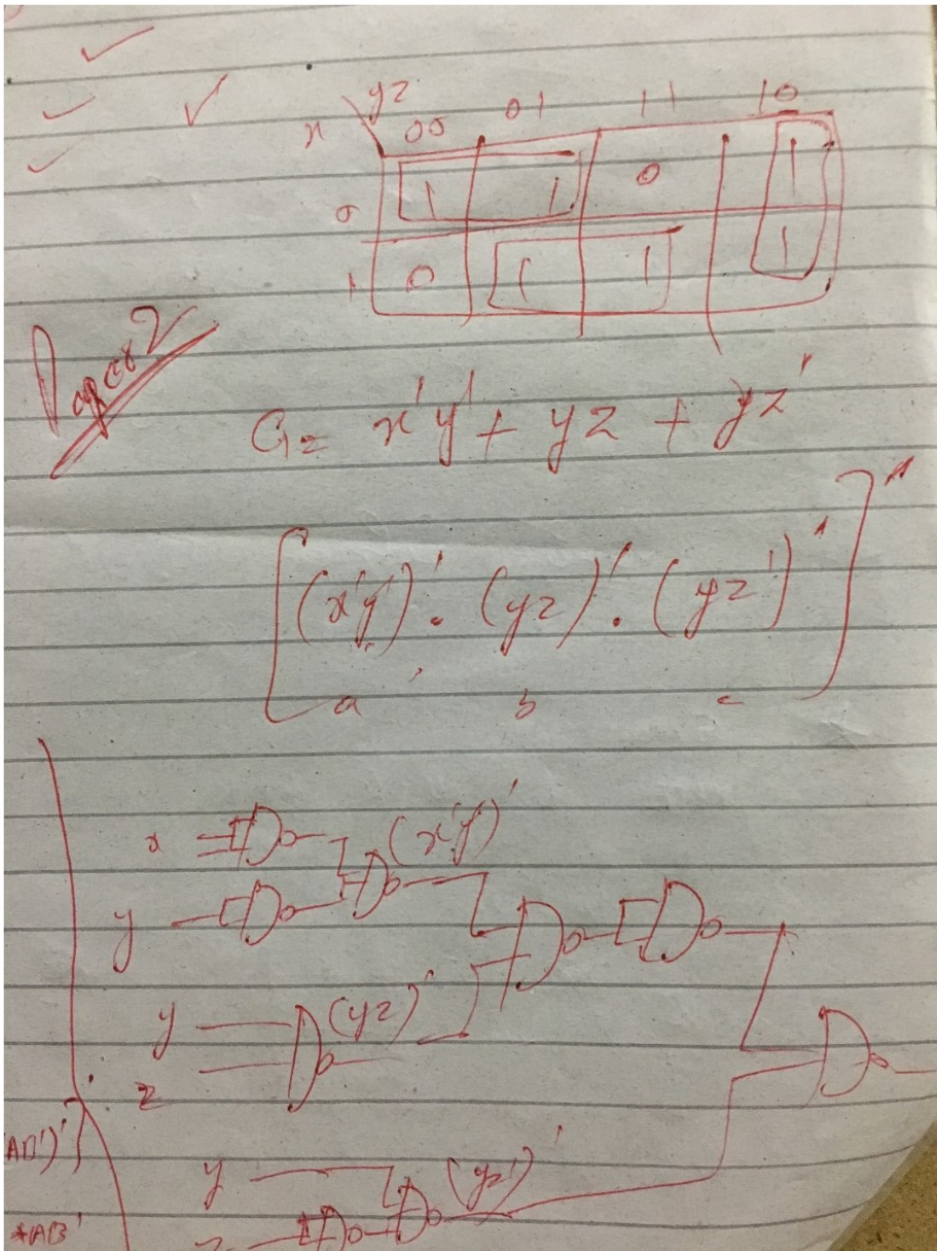
1	1	1	1

b. Write Output Equation in Sum of Minterms Form. **[1 Point]**

$$F = x'y'z' + x'y'z + x'yz' + xy'z + xyz' + xyz$$

c. Write Optimized version of above output equation using K-Maps. **[3 Points]**

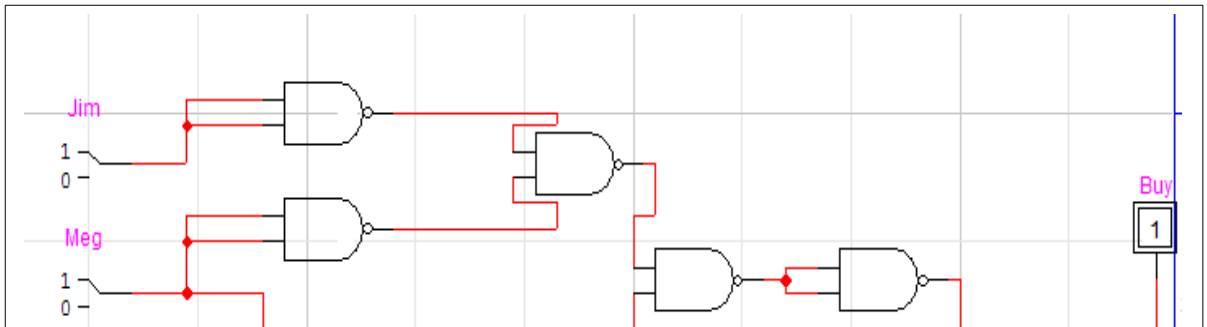
$$F = x'y' + yz + yz'$$



d. Write NAND implementation of your optimized equation and draw the circuit using 2-input NAND gates only.

[4 Points]

F = [(x'y')'. (yz)'. (yz')']'



e. Implement the circuit of part (d) on the trainer board and verify the results (Use NAND Gates only). **(Note: Use as minimum no. of logic gates as possible)**
[15 Points]