Assignment #1
Due: Wednesdays 14th of Feburary, 2018 before 11:55 pm

Note:

1. Dont forget to write your name, section and roll number on the assignment
2. Don't knock at the door. Just slide beneath the door of my office.
3. Late submissions receive zero credit.
4. If you write only the correct answer without steps you get very low credit.

Q:-1.   [Points 10 * 6 = 60]

Prove the following algebraically (quote the law applied)

a) $(A + B)(A + B`) = A$
b) $A`B` + A`B + AB` + AB = 1$
c) $W`Y`Z` + WY' + XY Z + W`Y Z` + W`XY + WX`Y` = W`Z` + WY` + XY Z$
d) $AB`C`D + AB`CD = AB`D$
e) $(AB` + D)(AB` + D + CF`) = AB` + D$
f) $Y + X`Z + XY` = X + Y + Z$

Q:-2.   [Points 14*5 = 70]

Consider the function $F(a, b, c) = ab + b`c$

a) Convert the function F into standard SOP form using Boolean simplifications.
b) Directly plot the function F on the 3 Map without any additional step.
c) Compute the simplified expression of   F in SOP form using the 3 MAP.
d) Compute its simplified expression of   F in POS form using the 3 MAP.
e) Compute the simplified expression of   F` in SOP form using the 3 MAP.
f) Compute its simplified expression of   F` in POS form using the 3 MAP.
g) Represent the function F in terms of minterms.
h) Represent the function F in terms of maxterms.
i) Represent the function F ` in terms of minterms
j) Represent the function F ` in terms of maxterms.
k) Draw the logic circuit of the simplified expression in part (c) using only the NAND gates.
l) Draw the logic circuit of the simplified expression in part (c) using only the NOR gates.
m) Draw the truth table of the original function i.e., $F(a, b, c) = ab + b`c$.
n) Draw the wave form of the original function i.e., $F(a, b, c) = ab + b`c$.