Chapter-4 Assignment

Due Date: 27th March 2021

Extended: 30th March 2021

1. **Solve the below**
   i. $(658.825)_{10} = (\quad)_8$
   ii. $(532.65)_{10} = (\quad)_{16} = (\quad)_2$
   iii. $(5372.65)_8 = (\quad)_{10} = (\quad)_2$
   iv. $(9398.65)_{16} = (\quad)_8 = (\quad)_2$
   v. $(11000110.010101)_2 = (\quad)_{10} = (\quad)_8 = (\quad)_{16}$
   vi. $(ABCDE.FGH)_{16} = (\quad)_{10} = (\quad)_8$

2. **Perform the below using 1s complement and 2s complement independently**
   a. $(56)_{10} - (34)_{10}$
   b. $(85)_{10} - (105)_{10}$
   c. $(65)_{10} - (155)_{10}$

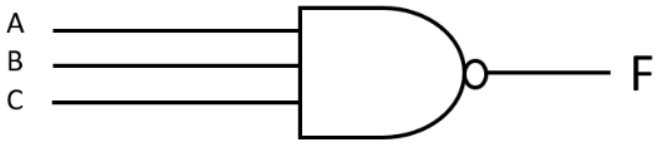
3. **Write the Graphical Symbol, Boolean Expression's function, Switch representation and Truth Table for the following Gates**
   a. OR
   b. AND
   c. NOT
   d. NOR
   e. NAND
   f. Exclusive-OR
   g. Exclusive-NOR

4. **Consider three inputs to a GATE and represent the following symbolically**
   a. 3 input NOR Gate
   b. 3 input NAND Gate

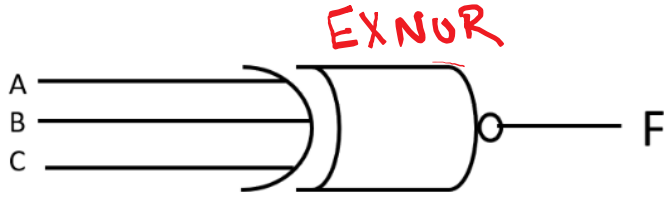
5. For the following Gate inter Connections

- Write the output Boolean expression (i.e., F)
- Truth Table of 'F'

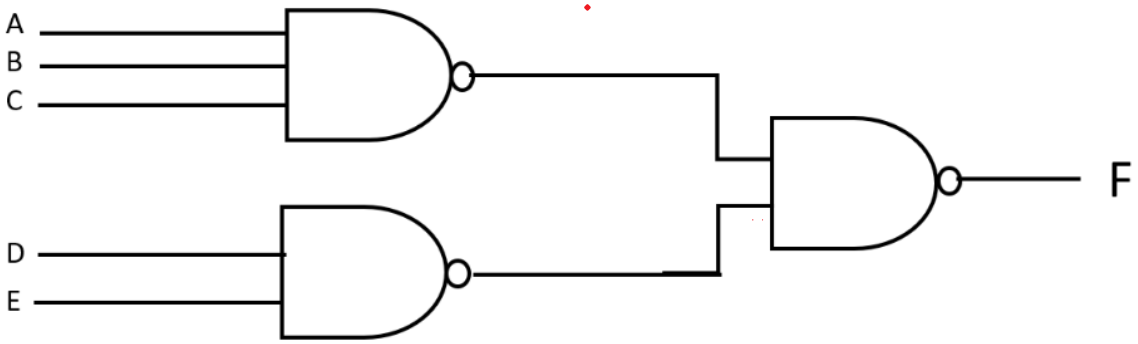
I)



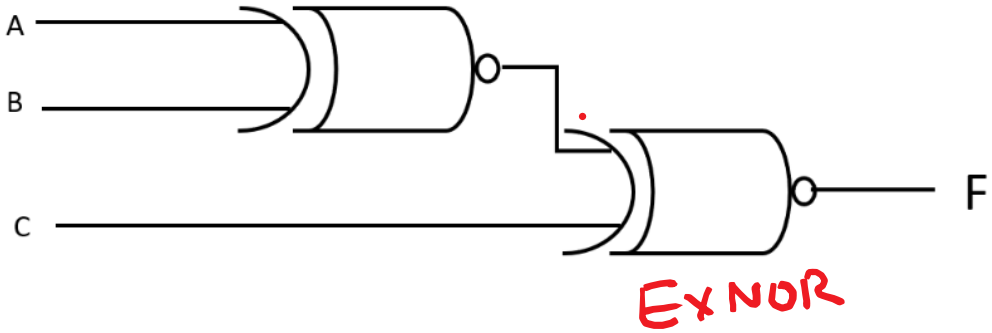
II)



III)



IV)



6. Simplify the following Boolean Expressions to a minimum number of literals (ie., variables)

a. AB + A + AB (Ans: A)

b. $\overline{A\overline{B} + ABC + A(B + A\overline{B})}$ (Ans: 0)

c. $ABC + AB\overline{C} + \overline{B}A$ (Ans: AB+BC)

d. $\overline{AB + ABC + A(B + A\overline{B})}$ (Ans: 0)

e. $\overline{A}+AB + A\overline{C} + A\overline{B}C$ (Ans: $\overline{A}+B + \overline{C}$)

f. (A+B) (A+$\overline{B}$) (Ans: A)

g. $\overline{A}B(\overline{D} + \overline{C}D)+ B(A + \overline{A}CD)$ (Ans: B)

h. ($\overline{A}$+C) ($\overline{A}$+$+\overline{C}$)$(A + B + \overline{C}D)$ (Ans: $\overline{A}$(B+$\overline{C}$D))

7. Realize the below Boolean expressions using logic gates

a. F = $AB + C\overline{D} + \overline{B}C$

b. F = (A+B) ($\overline{C}$ + $\overline{B}$) ($\overline{D}$ + $D + E$)

8. Given the following Boolean Function

F = $A\overline{B}C + \overline{A}BC + \overline{D}AB$ + D$\overline{A}B$ + DAB

a. Obtain the truth table for the given function 'F'

b. Draw the logic gate diagram using Boolean expression

c. Simplify the function to a minimum number of literals using Boolean algebra (Ans: $\overline{B}C + B(D + A)$)

d. Obtain the truth table using the simplified function obtained from 8(c)

PPT **9.** Write in brief about the following Memory Elements:

SRAM, DRAM, ROM, PROM, EPROM, EEPROM.

Reference Book for Digital Electronics: 'Digital Design' by Morris Mano

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