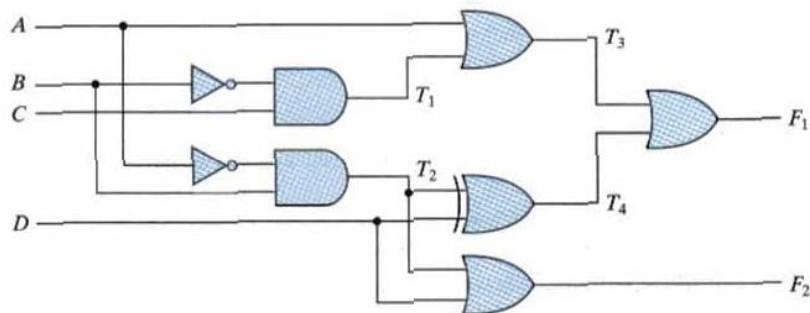# EC 2.101 - Digital Systems and Microcontrollers
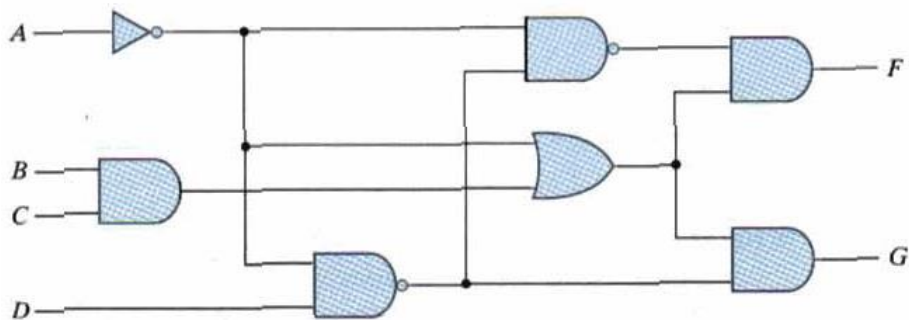
Practice Sheet 2 (Lec 8 – Lec 14)

Q1. Simplify the Boolean functions using K-maps

- a) $F(x,y,z)= \Sigma (0,1,5,7)$
- b) $F(A,B,C,D)= \Sigma (3,7,11,13,14,15)$
- c) $F(A,B,C,D)= \Sigma (2,3,12,13,14,15)$
- d) $F(w,x,y,z)= \Sigma (1,3,7,11,15)$, don't care conditions $d(w,x,y,z)=\Sigma (0,2,5)$

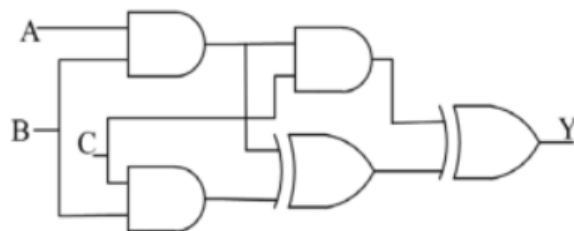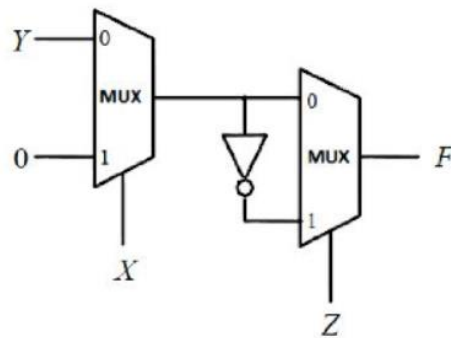**Q2.** Derive the expressions for F1 and F2 and make a truth table

Q3. Derive the expressions for F and G and simplify using K maps.

Q4. Find the output of the combinational circuit given below

Q5. Find the Boolean expression *F* implemented by the circuit given below

Q6. Design a combinational circuit with three inputs and one output.

    (a) The output Is 1 when the binary value of input is less than 3. The output is 0 otherwise.

    (b) The output is 1 when the binary value of the input is an even number.

Q7. Design a four-bit combinational circuit 2's complementer. (The output generates the 2's complement of the input binary number.)