Name: KEY Id#

COE 202, Term 151

Digital Logic Design

Quiz# 2

 Date: Thursday, Sep. 17

#

**Q1** Use Boolean algebra to simplify the following equations into the given number of literals in sum-of-product form. Show clearly all your steps.

|  |
| --- |
|  = A B + A' C + B C + B C' + B' C [by consensus between A B and A' C]= A B + A' C + B [C + C'] + B' C [by distributive law]= A B + A' C + B + B' C = A' C + B + B' C [by absorption]= A' C + (B + B')(B+ C) [by distributive law] = A' C + B + C = B + C [by absorption]   |
|  = A' . (B' + C') + B [by Demorgan's law]= A' B' + A' C' + B [by distributive law]= (A' + B)(B' + B) + A' C' [by distributive law]= A' + B+ A' C'= A' + B [by absorption] |
| **Q2.** Given the Boolean function $F\left(X,Y,Z\right)=\left(X+Y\right)(\overbar{X}\overbar{Y}+X Z)$: 1. Express F as a **product-of-Maxterms**, $F=\prod\_{}^{}M$.

F = X Z +X Y Z = X Z =∑m(5, 7) = $\prod\_{}^{}M(0, 1, 2, 3, 4, 6)$1. Find the ***algebraic* sum-of-minterms** expression for *F*.
 |
|  F =∑m(5, 7) = X Y' Z + X Y Z |