Name: KEY Id#

COE 202, Term 122

Digital Logic Design

Quiz# 2

 Date: Saturday, Feb. 23

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# **Q1**. Simplify the following Boolean functions to the **minimum** number of literals sum-of-product expressions using algebraic manipulation:

## $A B+\overbar{B} C+A C D+A B \overbar{D}+A C \overbar{D} $

$$ =A B+\overbar{B} C+A C D+A C \overbar{D} as AB\overbar{D} is absorbed by AB$$

$$ =A B+\overbar{B} C+A C (D+ \overbar{D} )$$

$$ =A B+\overbar{B} C+A C as D+\overbar{D}=1$$

$$ =A B+\overbar{B} C by consensus$$

## $\overbar{(\overbar{(A+\overbar{B} C )}.\left(A+\overbar{C } \overbar{D} \right)+\overbar{AC})}$

$$ =\overbar{(\overbar{[(A+\overbar{B} C )}.\left(A+\overbar{C } \overbar{D} \right)]+\overbar{AC})}$$

 $=(\left[ ̿+\overbar{\left(A+\overbar{C } \overbar{D} \right)} \right]. ̿$ )

$$ =(\left[ \left(A+\overbar{B} C \right)+ \overbar{A}.(C+D)\right]. AC$$

$$ =AC+A\overbar{ B} C $$

$$ =AC$$

**Q2**. Express the function $F\left(A, B, C\right)= A +\overbar{B} C $as:

## Sum of minterms $F(A, B, C)= \sum\_{}^{}m( ) $

$$ F(A, B, C) = \sum\_{}^{}m(1, 4, 5, 6, 7 )$$

## Product of maxterms $F\left(A, B, C\right)= \prod\_{}^{}M\left( \right) $

$$ F\left(A, B, C\right)= \prod\_{}^{}M( 0, 2, 3) $$