Name: KEY **Id#**

COE 202, Term 112
Digital Logic Design

Quiz# 2

Date: Monday, Feb. 18

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

(i) A D' + A' B D' + A' C D' + B' C' D'

= D' (A + A' B + A' C + B' C')	by distributive law
= D' (A + A' B + B + A' C + C + B' C')	by consensus
= D' (A + B + C + B' C')	by absorption
= D' (A + B + C + B')	by consensus
= D' (1)	
= D'	

(ii) { [(A B)' A]' [(A B)' B]' }'

= (A B)' A + (A B)' B	by Demorgan's law
= (A B)' (A + B)	by distributive law
= (A' + B') (A + B)	by Demorgan's law
= A' A + A' B + A B' + B B'	by Demorgan's law
= A' B + A B'	

(iii) (A + B + C)(A + B + C') (A' + C')(B + C')

We first take the dual to make simplification easier.

Dual = A B C + AB C' + A' C' + B C'

= A B (C + C') + A' C' + B C' by distributive law

= A B + A' C' + B C'

= A B + A' C' by consensus law

We now take the dual again:

(A + B) (A' + C')

= A A' + A C' + A' B + B C' by distributive law

= A C' + A' B + B C'

= A C' + A' B by consensus law