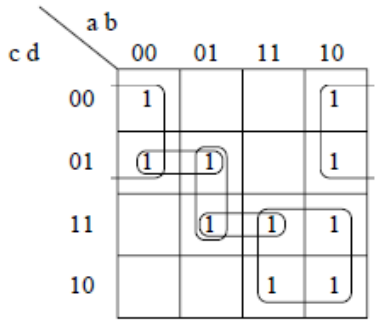
Name_____ **Student ID**_____ **Colleges & Schools**_____ **Department**_____

Quiz Unit 5 Solutions

1. Simplify the following expression first by using a map and then by using Boolean algebra. Use the Karnaugh map as a guide to determine which theorems to apply to which terms for the algebraic simplification.

$$F = a'b'c' + a'c'd + bcd + abc + ab'$$

Sol.)



F = a′b′c′ + a′c′d + bcd + abc + ab′

= (a′b′c′ + ab′) + a′c′d + bcd + (abc + ab′)

= (a′c′+a)b′ + (a′c′d+bcd) + a(bc+b′) Elimination Theorem (X+X′Y = X+Y)

= (c′+a)b′ + (a′c′d+bcd+a′bd) + a(c+b′) Consensus Theorem

= (b′c′+a′bd+a′c′d) + (bcd+a′bd+ac) + ab′ Consensus Theorem

= (b′c′+ac+ab′) + a′bd Consensus Theorem

= b′c′+ac+a′bd