Computer Architecture

Tutorial 1 – Boolean Algebra - Answers

1) Write the Truth Table for the following Boolean expression: R = A • B + C'

A	B	C	C'	A • B	R = A • B + C'
0	0	0	1	0	1
0	0	1	0	0	0
0	1	0	1	0	1
0	1	1	0	0	0
1	0	0	1	0	1
1	0	1	0	0	0
1	1	0	1	1	1
1	1	1	0	1	1

2) Simply the following Boolean Expressions to its simplest form

a) R = A + A' • B

R	= (A + A') • (A + B)	Distributive Rule
	= 1 • (A + B)	Negation Rule
	= A + B	Simplification Rule

b) R = A • (A' + B)

R	= (A • A') + (A • B)	Distributive Rule
	= 0 + A • B	Negation Rule
	= A • B	Simplification Rule

c) R = (A + C) • (A • D + A • D') + A • C + C

R	= (A + C) • (A • (D + D')) + A • C + C	Distributive Rule
	= (A + C) • A + A • C + C	Negation Rule
	= A • A + C • A + A • C + C	Distributive Rule
	= A + A • C + C	Idempotent Rule
1 . (A + C) + C	~~= A • (1 + C) + C~~ -----	Distributive Rule
A+C+C	= A + C	Simplification Rule
A+C		