BLG 231E Homework 1

1.

a. A + B = 01000011 : A
11111010 : B
+_____
100111101
^
(Ignored)

1's Complement of B: 00000101
1
+_____
2's Complement of B: 00000110

A − B = 010000011 : A
000000110 : −B
+_____
010001001

b. A + B = 01000011 : A
00001010 : B
+_____
01001101

1's Complement of B: 11110101
1
+_____
2's Complement of B: 11110110

A − B = 01000011 : A
11110110 : −B
+_____
100111001
^
Carry = 1 : No Borrow

2.

a. E_1 = (ab'c(c + b'd) + a'b')c
= (ab'c + a'b')c — c(c + b'd) = c (Absorption)
= (b'(ac + a'))c
= (b'(a' + c))c — ac + a' = (a + a')(a' + c)
= a'b'c + b'c — b'c(a' + c) = (a'b'c + b'c)
= b'c — a'b'c + b'c = b'c (Absorption)

b. E_2 = a'bc + ab'c' + a'b'c + ab'c + abc
= (a'b + ab' + a'b' + ab)c + ab'c'
= c + ab'c'
= ab' + c