BLG 231E Homework 2

1.

a.

First Canonical Form

E_1 = a'b'cd+a'bc'd'+a'bcd'+a'bcd+abc'd'+abcd'

Second Canonical Form

E_2 = (a+b+c+d)(a+b+c+d')(a+b+c'+d)(a+b'+c+d')(a'+b+c+d)
(a'+b+c+d')(a'+b+c'+d)(a'+b+c'+d')(a'+b'+c+d')(a'+b'+c'+d')

b. E_1 = a'b'cd+a'bc'd'+a'bcd'+a'bcd+abc'd'+abcd'

Consenus term of abc'd' and abcd' is abd'.

= a'b'cd+a'bc'd'+a'bcd'+a'bcd+~~abc'd'+abcd~~'+abd'.

Consenus term of a'bcd' and a'bcd is a'bc.

= a'b'cd+a'bc'd'+~~a'bcd'+a'bcd+~~abd'+a'bc

Consenus term of a'b'cd and a'bc is a'cd.

a'cd+a'b'cd = a'cd because of absorption.

= ~~a'b'cd~~+a'bc'd'+abd'+a'bc+a'cd

Consenus term of a'bc'd' and abd' is bc'd'.

bc'd'+a'bc'd' = bc'd' because of absorption.

= ~~a'bc'd~~'+abd'+a'bc+a'cd+bc'd'

Consenus term of abd' and a'bc is bcd'.

bcd'+bc'd' = bd'(c+c') = bd'.

bd'+abd' = bd' because of absorption.

= a'bc+a'cd+bd'

Since a'bc is Consenus term for a'cd and bd' we can cancel it out.

= a'cd+bd'

c.