Theoretical Assignment 1 25F

1. Convert the decimal number 123.4 to base 7, base 12, and base 16, retain maximum two digits after the radix point if necessary (no need to round).

2. Perform subtraction on the given unsigned numbers using the 10's complement of the subtrahend. Where the result should be negative, find its 10's complement and affix a minus sign.

a) 4,637 - 2,579
b) 125 - 1,800

3. Simplify the following Boolean expressions to a minimum number of literals using algebraic method:

a) yz'(z + xz') + (x' + z')(x'y + x'z)
b) A(B + C) + BD'(A' + C)

4. Express the Boolean expression bd' + acd' + ab'c + a'c' in sum of minterms form with Σ

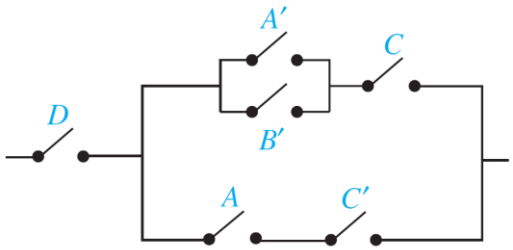
5. Express the Boolean expression a+b'c in product of maxterms form with Π (The conversion with the help of sum of minterm form is not allowed)

6. Simplify the following three-variable Boolean functions algebraically to simplest standard form using K-map method:

a) $F_1(A,B,C) = \Sigma(0, 1, 2, 3, 5)$ to sum of product form
b) $F_2(B,C,D) = (cd + b'c + bd')(b + d)$ into product of sum form

7. For the following switch circuit:

a) Derive the switching algebra expression that corresponds one to one with the switch circuit.
b) Derive the truth table corresponding to this switch circuit.
c) Simplify the algebra expression to minimum number of literals using K-map method.



8. Draw the circuit specified by the following HDL description

```
module hw (
    output F,
    input  s,
    input  a,
    input  b
```

```
);
	wire s_n;
	wire a_en;
	wire b_en;

	assign s_n    = ~s;
	assign a_en = s & a;
	assign b_en = s_n & b;
	assign F       = a_en | b_en;
endmodule
```