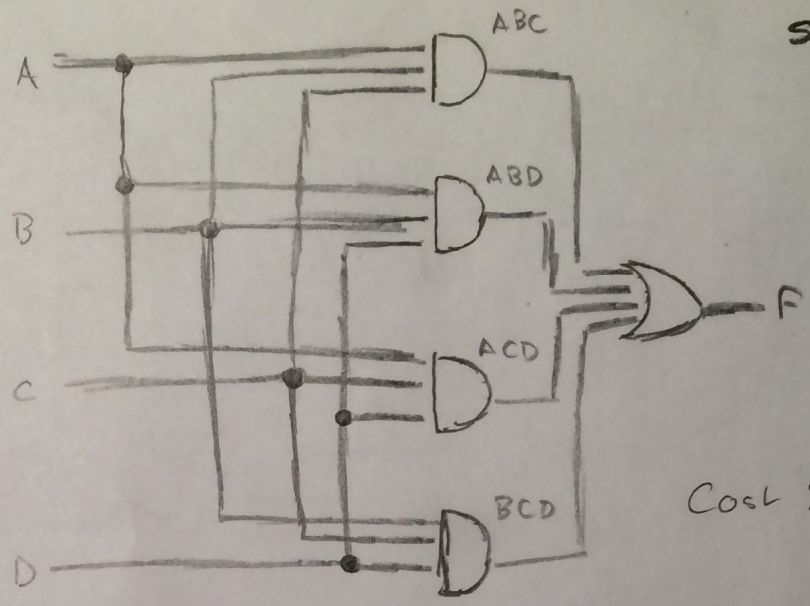
Sean Gordon

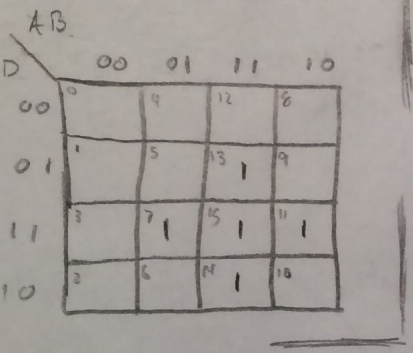
A	B	C	D	F	
0	0	0	0		
0	0	0	1		
0	0	1	0		
0	0	1	1		
0	1	0	0		
0	1	0	1		
0	1	1	0		
0	1	1	1	1	7
1	0	0	0		
1	0	0	1		
1	0	1	0		
1	0	1	1	1	11
1	1	0	0		
1	1	0	1	1	13
1	1	1	0	1	14
1	1	1	1	1	15

$\bar{A}BCD + A\bar{B}CD + AB\bar{C}D + ABC\bar{D} + ABCD \Rightarrow BCD + ACD + ABD + ABC$

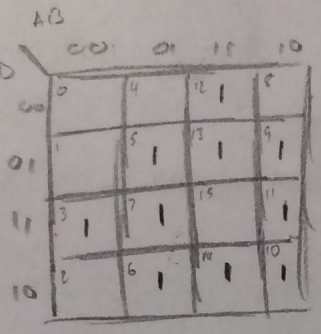
1)



Cost : 21



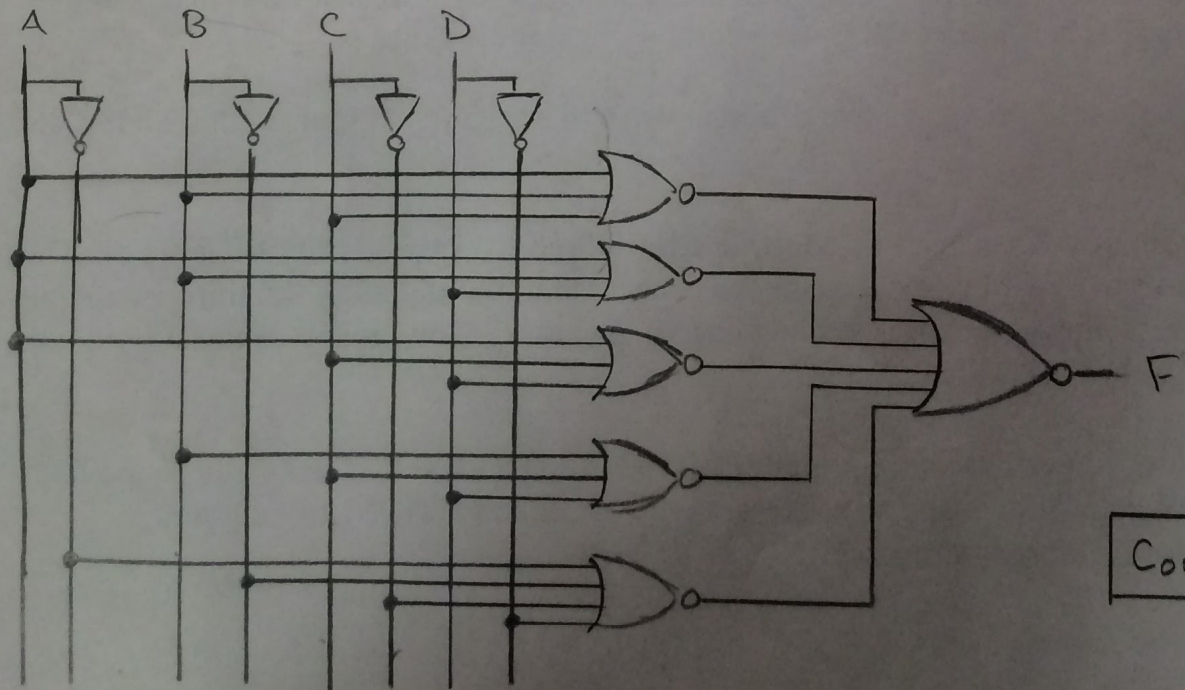
2)



$\bar{a}\bar{b}\bar{c}\bar{d} + \bar{a}\bar{b}cd + \bar{a}b\bar{c}d + \bar{a}bc\bar{d} + a\bar{b}\bar{c}\bar{d} + a\bar{b}cd + abcd$

$\bar{a}\bar{b}\bar{c} + a\bar{b}\bar{d} + \bar{a}\bar{c}\bar{d} + b\bar{c}\bar{d} + abcd \Rightarrow \bar{F} = \bar{a}\bar{b}\bar{c} + a\bar{b}\bar{d} + \bar{a}\bar{c}\bar{d} + b\bar{c}\bar{d} + abcd \Rightarrow$

$\bar{F} = (a+b+c)(a+b+\bar{d})(a+\bar{c}+\bar{d})(b+\bar{c}+\bar{d})(\bar{a}+\bar{b}+\bar{c}+\bar{d})$

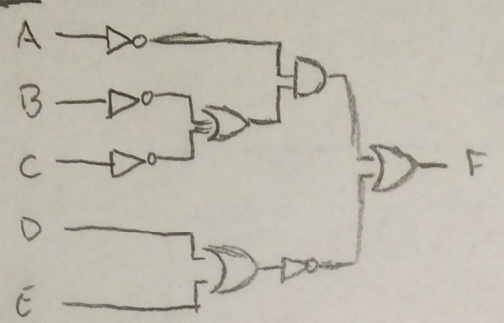


Cost : 35

```
1) ----------------------------------------
module Class7Question1(F,A,B,C);
    input A,B,C;
    output F;                                   Sean Gordon
                                                495 762 295
    not(D,C);
    or(G,A,B);
    or(H,B,D);
    and(F,G,H);
endmodule


2) ----------------------------------------
module Class7Question2(F1,F2,A,B,C,D);
    input A,B,C,D;
    output F1,F2;

    assign F1 = ((A&~C)|(B&~C)|(~C&~D)|(A&B)|(A&~D
    assign F2 = ((A|~C)&(A|B|C)&(B|~C|~D))
endmodule


3) ----------------------------------------
module Class7Question3(F,S,A,B);
    input S,A,B;
    output reg F;

    always @(S<A<B)
        if(S==0)
            F=A;
        else
            F=B;
endmodule
```

Class 8

1 a) $F(a,b,c,d,e) = \bar{a}(\bar{b}+\bar{c})+(d+e)'$



b)

	PMOS	NMOS
Not	1	1
And	x+1	x+1
Or	x+1	x+1

x = num of inputs

c)

	PMOS	NMOS	TOT
Not	4	4	8
And	3	3	6
Or	9	9	18
TOT	16	16	32

Total Cost: 32

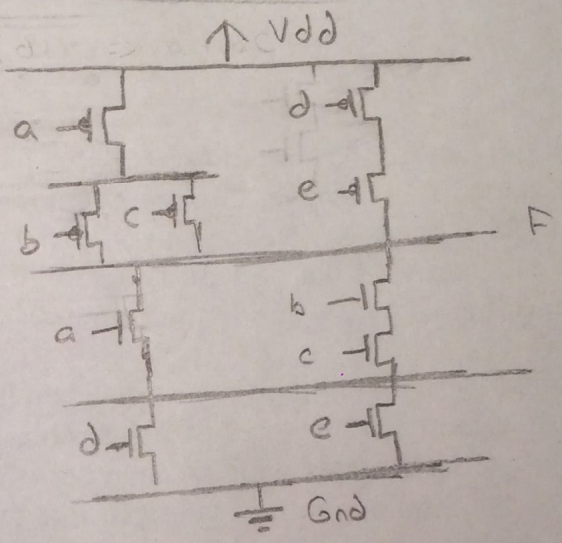
d) $\bar{F} = \overline{\bar{a}(\bar{b}+\bar{c})+(d+e)} \Rightarrow$

$(\bar{\bar{a}}+\overline{(\bar{b}+\bar{c})})\overline{(d+e)} \Rightarrow$

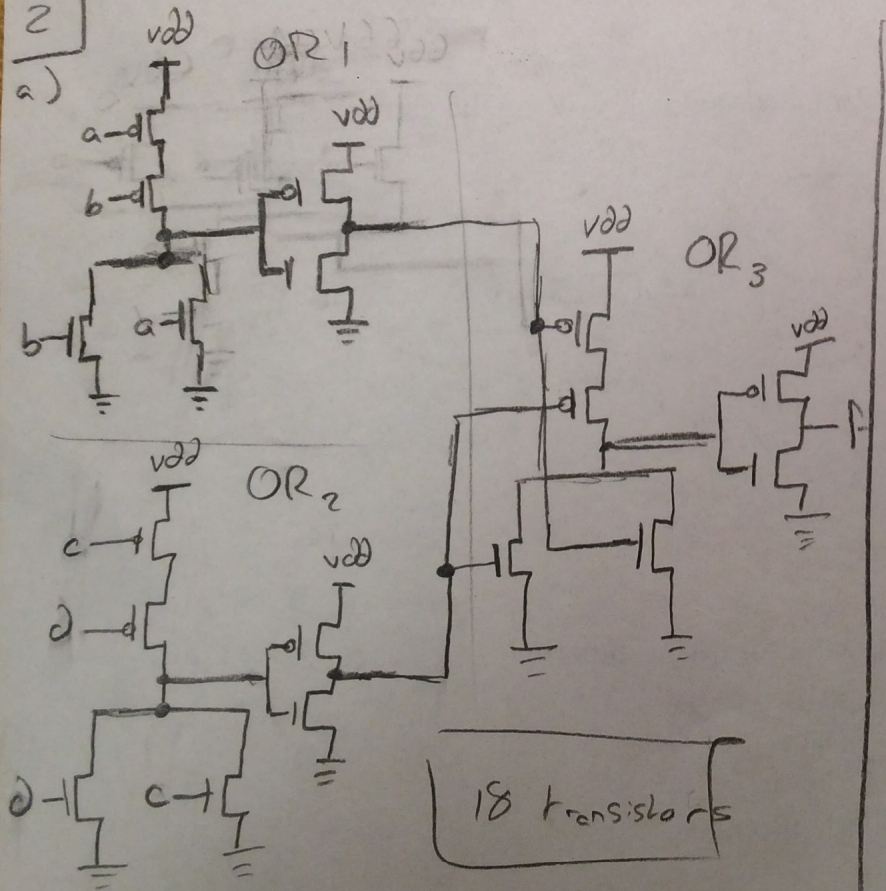
$(a+(\bar{b}\bar{c}))(d+e) \Rightarrow$

$\boxed{(a+bc)(d+e)}$

e)

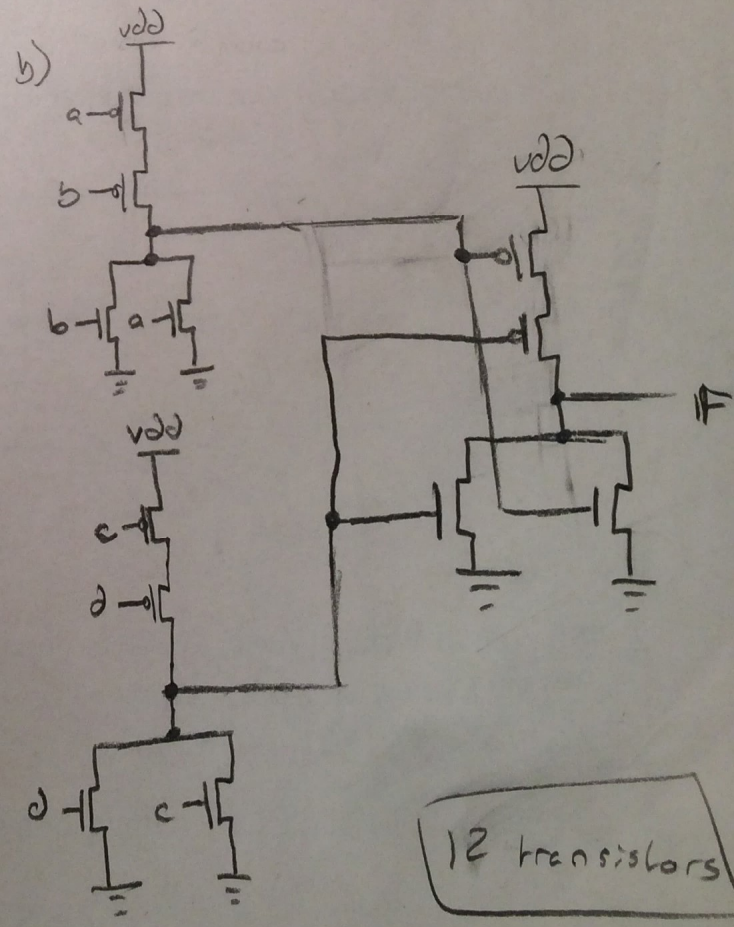


2 a)



18 transistors

b)



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