Exercícios Portas Lógicas
Álgebra Booleana – parte 1

Mcs *Eduardo Verri*
Drª *Marise Miranda*

1) Dado o circuito abaixo faça a tabela verdade e a expressão booleana

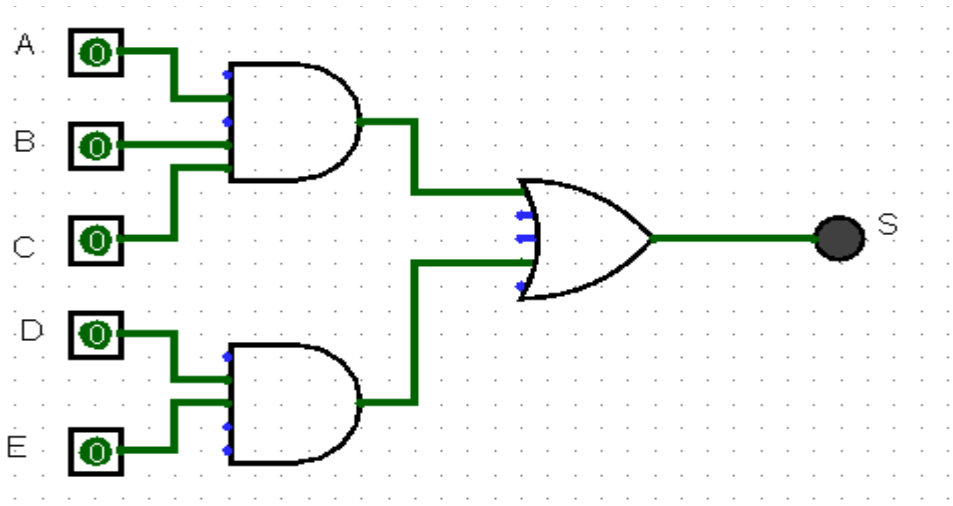


Tabela verdade:

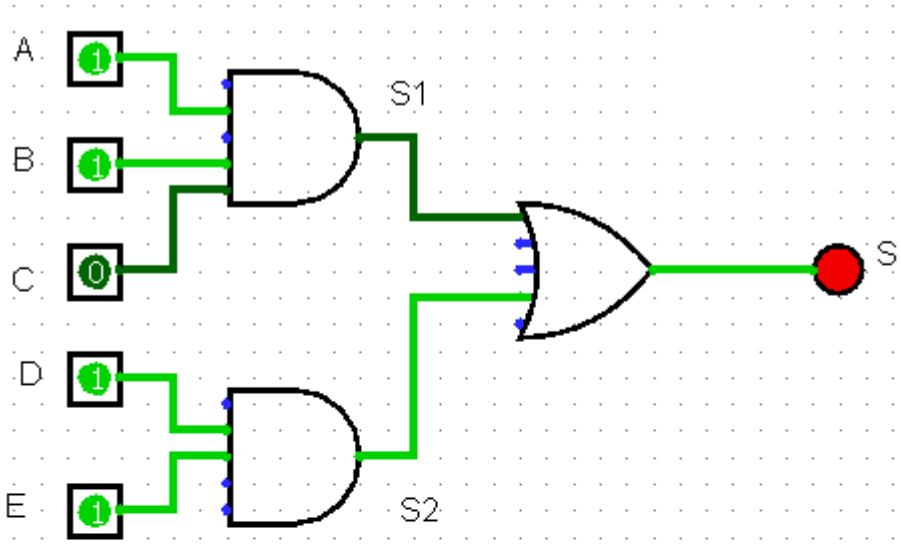
2^4	2^3	2^2	2^1	2^0				
A	**B**	**C**	**D**	**E**	**S1**	**S2**	**S**	
0	0	0	0	0	0	0	0	
0	0	0	0	1	0	0	0	
0	0	0	1	0	0	0	0	
0	0	0	1	1	0	1	1	S= (!A*!B*!C*D*E) 1
0	0	1	0	0	0	0	0	
0	0	1	0	1	0	0	0	
0	0	1	1	0	0	0	0	
0	0	1	1	1	0	1	1	S=(!A*!B*C*D*E) 2
0	1	0	0	0	0	0	0	
0	1	0	0	1	0	0	0	
0	1	0	1	0	0	0	0	
0	1	0	1	1	0	1	1	S= (!A*B*!C*D*E)
0	1	1	0	0	0	0	0	
0	1	1	0	1	0	0	0	
0	1	1	1	0	0	0	0	
0	1	1	1	1	0	1	1	S=(!A*B*C*D*E) 4
1	0	0	0	0	0	0	0	
1	0	0	0	1	0	0	0	
1	0	0	1	0	0	0	0	
1	0	0	1	1	0	1	1	S=(A*!B*!C*D*E) 5
1	0	1	0	0	0	0	0	
1	0	1	0	1	0	0	0	
1	0	1	1	0	0	0	0	
1	0	1	1	1	0	1	1	S=(A*C*D*E*!B) 6
1	1	0	0	0	0	0	0	

1	1	0	0	1	0	0	0		
1	1	0	1	0	0	0	0		
1	1	0	1	1	0	1	1	S=(!C*A*B*D*E)	7
1	1	1	0	0	1	0	1	S=(A*B*C*!D*!E)	8
1	1	1	0	1	1	0	1	S=(A*B*C*!D*E)	9
1	1	1	1	0	1	0	1	S=(A*B*C*D*!E)	10
1	1	1	1	1	1	1	1	S=(A*B*C*D*E)	11

S=(!A*B*!C*D*E)+(!A*!B*C*D*E)+(!A*B*!C*D*E)+(!A*B*C*D*E)+(A*!B*!C*D*E)+(A*!B*C*D*E)+(A*B*!C*D*E)+(A*B*C*!D*!E)+(A*B*C*!D*E)+(A*B*C*D*!E)+(A*B*C*D*E)

A expressão booleana acima refere-se a tabela verdade

Solução da expressão resumida via circuito lógico:



S1= (A*B*C)

S=(S1+S2)

S2=(D*E)

S=(A*B*C)+(D*E)

OUTRA FORMA DE RESPONDER:

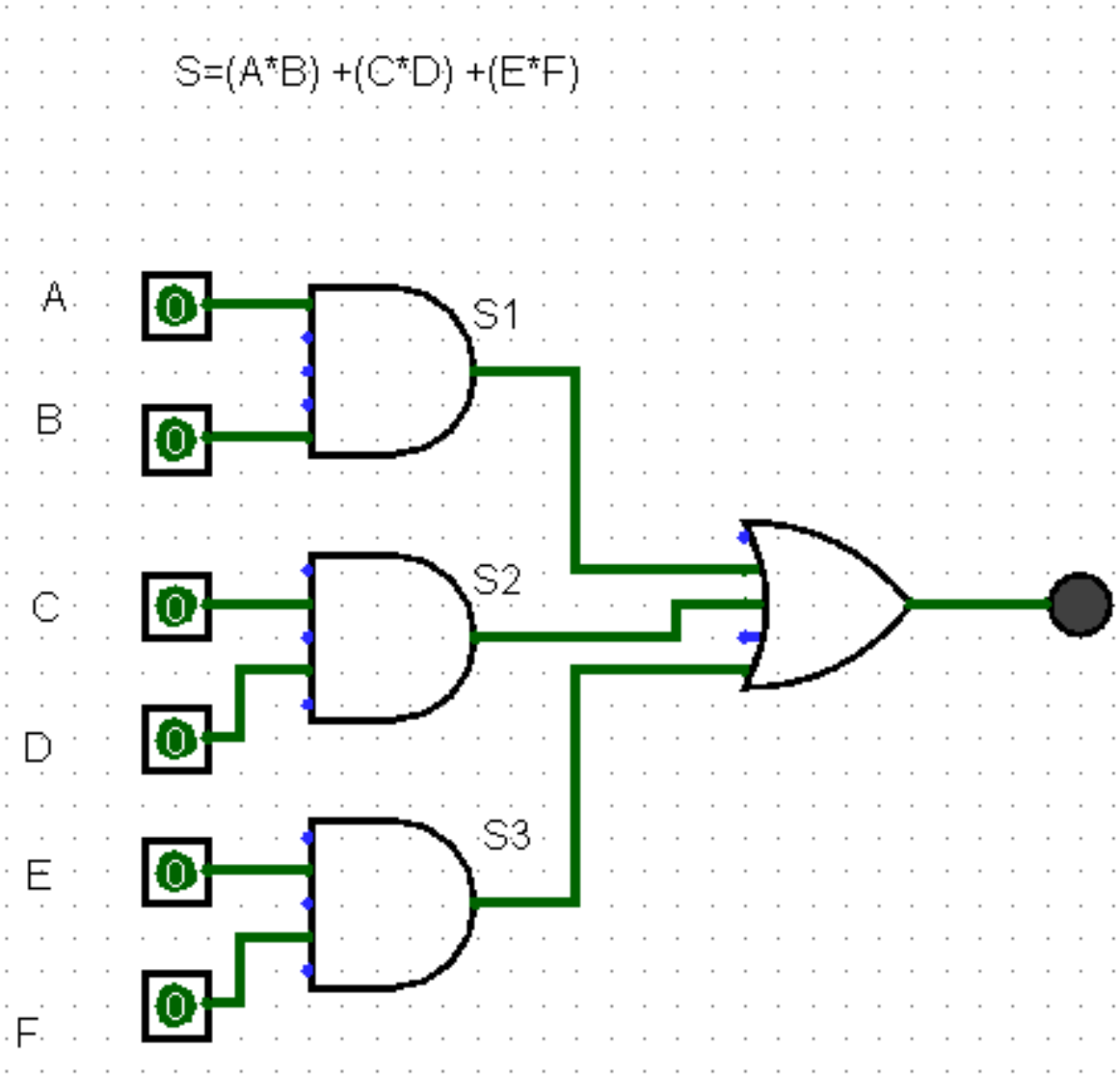
S=(ABC)+(DE)

2) Dada a expressão boolena apresente o circuito e a tabela verdade

S = (AB) + (CD) + (EF)

Solução:

Vamos desenhar o circuito lógico a partir da expressão lógica



Vamos fazer a tabela verdade

2^5	2^4	2^3	2^2	2^1	2^0				
A	B	C	D	E	F	S1	S2	S3	S
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	0	0
0	0	0	0	1	0	0	0	0	0
0	0	0	0	1	1	0	0	1	1
0	0	0	1	0	0	0	0	0	0
0	0	0	1	0	1	0	0	0	0
0	0	0	1	1	0	0	0	0	0
0	0	0	1	1	1	0	0	1	1
0	0	1	0	0	0	0	0	0	0
0	0	1	0	0	1	0	0	0	0
0	0	1	0	1	0	0	0	0	0
0	0	1	0	1	1	0	0	1	1
0	0	1	1	0	0	0	1	0	1
0	0	1	1	0	1	0	1	0	1
0	0	1	1	1	0	0	1	0	1
0	0	1	1	1	1	0	1	1	1
0	1	0	0	0	0	0	0	0	0
0	1	0	0	0	1	0	0	0	0
0	1	0	0	1	0	0	0	0	0
0	1	0	0	1	1	0	0	1	1
0	1	0	1	0	0	0	0	0	0
0	1	0	1	0	1	0	0	0	0
0	1	0	1	1	0	0	0	0	0
0	1	0	1	1	1	0	0	1	1
0	1	1	0	0	0	0	0	0	0
0	1	1	0	0	1	0	0	0	0
0	1	1	0	1	0	0	0	0	0
0	1	1	0	1	1	0	0	1	1
0	1	1	1	0	0	0	1	0	1
0	1	1	1	0	1	0	1	0	1
0	1	1	1	1	0	0	1	0	1
0	1	1	1	1	1	0	1	1	1
1	0	0	0	0	0	0	0	0	0
1	0	0	0	0	1	0	0	0	0
1	0	0	0	1	0	0	0	0	0
1	0	0	0	1	1	0	0	1	1
1	0	0	1	0	0	0	0	0	0
1	0	0	1	0	1	0	0	0	0
1	0	0	1	1	0	0	0	0	0
1	0	0	1	1	1	0	0	1	1
1	0	1	0	0	0	0	0	0	0
1	0	1	0	0	1	0	0	0	0
1	0	1	0	1	0	0	0	0	0
1	0	1	0	1	1	0	0	1	1
1	0	1	1	0	0	0	1	0	1
1	0	1	1	0	1	0	1	0	1

1	0	1	1	1	0	0	1	0	1
1	0	1	1	1	1	0	1	1	1
1	1	0	0	0	0	1	0	0	1
1	1	0	0	0	1	1	0	0	1
1	1	0	0	1	0	1	0	0	1
1	1	0	0	1	1	1	0	1	1
1	1	0	1	0	0	1	0	0	1
1	1	0	1	0	1	1	0	0	1
1	1	0	1	1	0	1	0	0	1
1	1	0	1	1	1	1	0	1	1
1	1	1	0	0	0	1	0	0	1
1	1	1	0	0	1	1	0	0	1
1	1	1	0	1	0	1	0	0	1
1	1	1	0	1	1	1	0	1	1
1	1	1	1	0	0	1	1	0	1
1	1	1	1	0	1	1	1	0	1
1	1	1	1	1	0	1	1	0	1
1	1	1	1	1	1	1	1	1	1

3) Dada a tabela verdade a seguir, desenhe o seu circuito lógico e a expressão booleana

A	B	C	D	S
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

Vamos fazer as expressões parciais e depois a expressão solução

A	B	C	D	S	
0	0	0	0	0	
0	0	0	1	0	
0	0	1	0	0	
0	0	1	1	0	
0	1	0	0	0	
0	1	0	1	1	S=(!A*B*!C*D)
0	1	1	0	0	
0	1	1	1	0	
1	0	0	0	1	S=(A*!B*!C*!D)
1	0	0	1	0	
1	0	1	0	0	
1	0	1	1	1	S=(A*!B*C*D)
1	1	0	0	0	
1	1	0	1	0	
1	1	1	0	0	
1	1	1	1	0	

S=(!A*B*!C*D)+(A*!B*!C*!D)+(A*!B*C*D)

Agora vamos fazer o circuito lógico a partir da expressão de interesse