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15385

DWD = Assignment #5

Q : 1

Answer.

$$A = 1, B = 0, C = 1$$

Sol

$$\Sigma = (A \oplus B) \oplus C$$

$$\Sigma = (1 \oplus 0) \oplus 1$$

$$\Sigma = (1) \oplus 1$$

$$\boxed{\Sigma = 0}$$

Answer

$$\text{cout} = AB + (A \oplus B) \text{cin}$$

$$\text{cout} = (1)(0) + (1 \oplus 0)1$$

$$\text{cout} = 0 + (1)(1)$$

$$\boxed{\text{cout} = 1}$$

Q : 2
Answer

$$\Sigma = 0, \text{ cout} = 0$$

A = ? B = ?
for Σ and cout
both to be zero.

The A and B must
be zero

$$A \neq 0, \quad B = 0$$

$$\Sigma = A \oplus B$$

$$0 = 0 \oplus 0$$

$$\text{Cout} = AB$$

$$\text{Cout} = 0 \cdot 0$$

Q : 3

Answer.

$$A = 1, \quad B = 1, \quad \text{cin} = 1$$

$$\Sigma = (A \oplus B) \oplus \text{cin}$$

$$\Sigma = (1 \oplus 1) \oplus 1$$

$$\Sigma = (0) \oplus 1$$

$$\boxed{\Sigma = 1}$$

$$\text{cout} = AB + (A \oplus B) \text{cin}$$

$$\text{cout} = 1 \cdot 1 + (1 \oplus 1) 1$$

$$\text{cout} = 1 + (0) 1$$

$$\boxed{\text{cout} = 1}$$

Ans

Q: 4

Answer

1	1	
A	B	Cin
Cout		Σ

$\Sigma 6$ $\Sigma 5$

1 0

0	1	
A	B	Cin
Cout		Σ

$\Sigma 4$

$\Sigma 4$

1

1	0	
A	B	Cin
Cout		Σ

$\Sigma 3$

$\Sigma 3$

1

1	0	
A	B	Cin
Cout		Σ

$\Sigma 2$

$\Sigma 2$

0	1	0	1
A	B	Cin	
Cout		Σ	

$\Sigma 1$

$\Sigma 1$

1

$$A = 10110$$

$$B = \frac{11001}{101111}$$

Ans

Q : 5

Answer

a) When the $\overline{\text{add/sub}}$ is high, the input bits of B will be complemented, and the resulting Σ will be the subtraction of the input bits.

b) When the $\overline{\text{add/sub}}$ input is low, the input of B will not be changed and the circuit will work as a parallel adder for the inputs.

Q: 6

Add/Subtr 1, $A = 1010, B = 1101$

for Σ_0 : $A_0 = 0, B_0 = 1 \oplus 1, C_{in} = 1$

$$\Sigma_0 = 0 + 0 + 1 = \boxed{1}, C_{out} = 0$$

for Σ_1 : $A_1 = 1, B_1 = 1 \oplus 0, C_{in} = 0$

$$\Sigma_1 = 1 + 1 + 0 = \boxed{0}, C_{out} = 1$$

for Σ_2 : $A_2 = 0, B_2 = 1 \oplus 1, C_{in} = 1$

$$\Sigma_2 = 0 + 0 + 1 = \boxed{1}, C_{out} = 0$$

for Σ_3 : $A_3 = 1, B_3 = 1 \oplus 1, C_{out} = 0$

$$\Sigma_3 = 1 + 0 + 0 = \boxed{1} \quad \text{Cut} = 0$$

$$\Sigma_1 = \Sigma_3 \Sigma_2 \Sigma_1 \Sigma_0 = 1101, \text{Cut} = 0$$

Ans ✓

Date

Q: 7

Answer

A₁

A₂

B₁

B₂

C_{in}

Σ₁

Σ₂

Count



Q 8

$$A_1 = 1010, A_2 = 1100, A_3 = 0101, A_4 = 1101$$

$$B_1 = 1001, B_2 = 1011, B_3 = 0000, B_4 = 0001$$

Sol:-

$$\begin{array}{cccccccc} A_4 & A_3 & A_2 & A_1 & + & B_4 & B_3 & B_2 & B_1 & = & \Sigma_5 & \Sigma_4 & \Sigma_3 & \Sigma_2 \\ 1 & 0 & 1 & 1 & & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 1 & 0 \\ 1 & 1 & 1 & 0 & & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 & & 1 & 0 & 1 & 1 & 1 & 0 & 1 & 1 & 1 \end{array}$$

$$\Sigma_5 = 0001$$

$$\Sigma_4 = 1100$$

$$\Sigma_3 = 1101$$

$$\Sigma_2 = 111?$$

$Z_1 = 0011$

Ans.

Q. 10

Answer

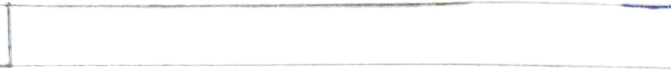
A₀



A₁



A₂



A₃



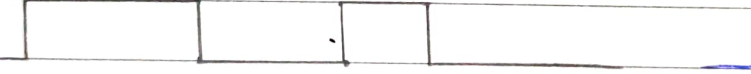
B₀



B₁



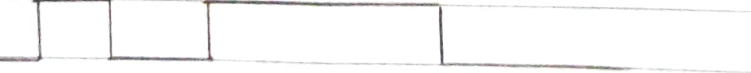
B₂



B₃



A=B



A < B



A > B

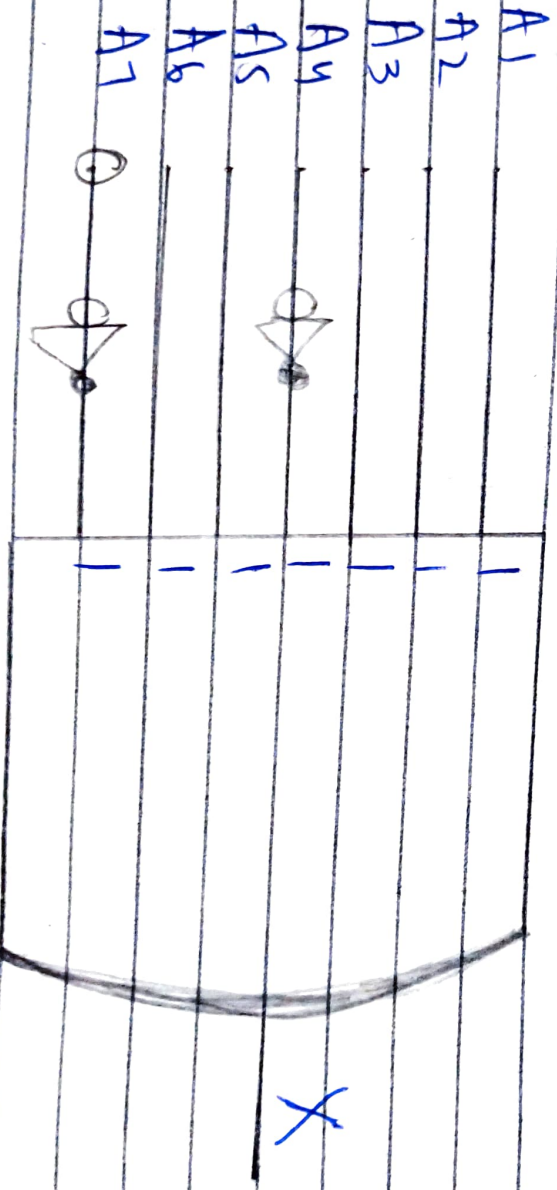


A < B —
 A = B —
 A > B —

Q : 11

Answer.

for the output be high for the given code 1101110 is the decoding logic that can be used to decode the given code.



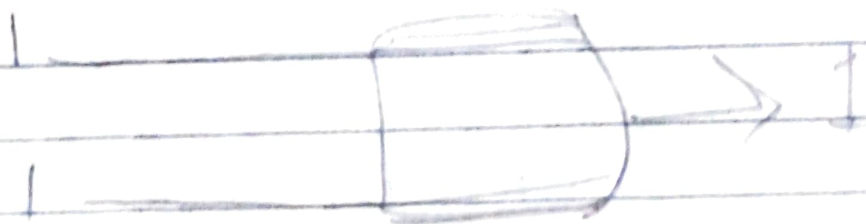
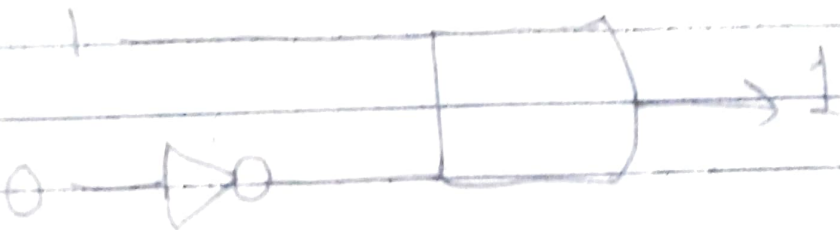
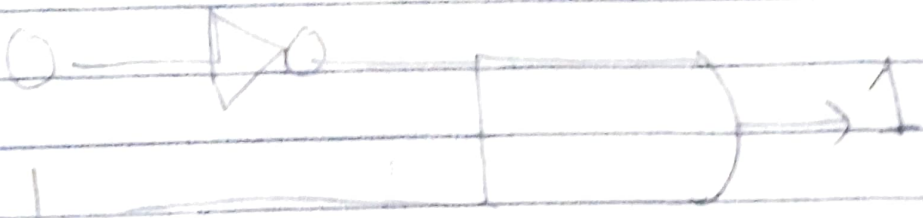
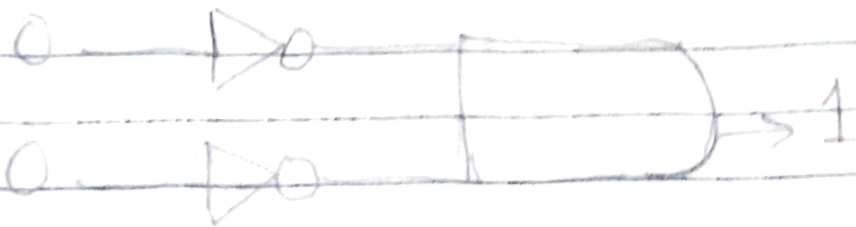
$$X = \overline{A_7} A_6 A_5 \overline{A_4} A_3 A_2 A_1$$

Answer

Q. 12

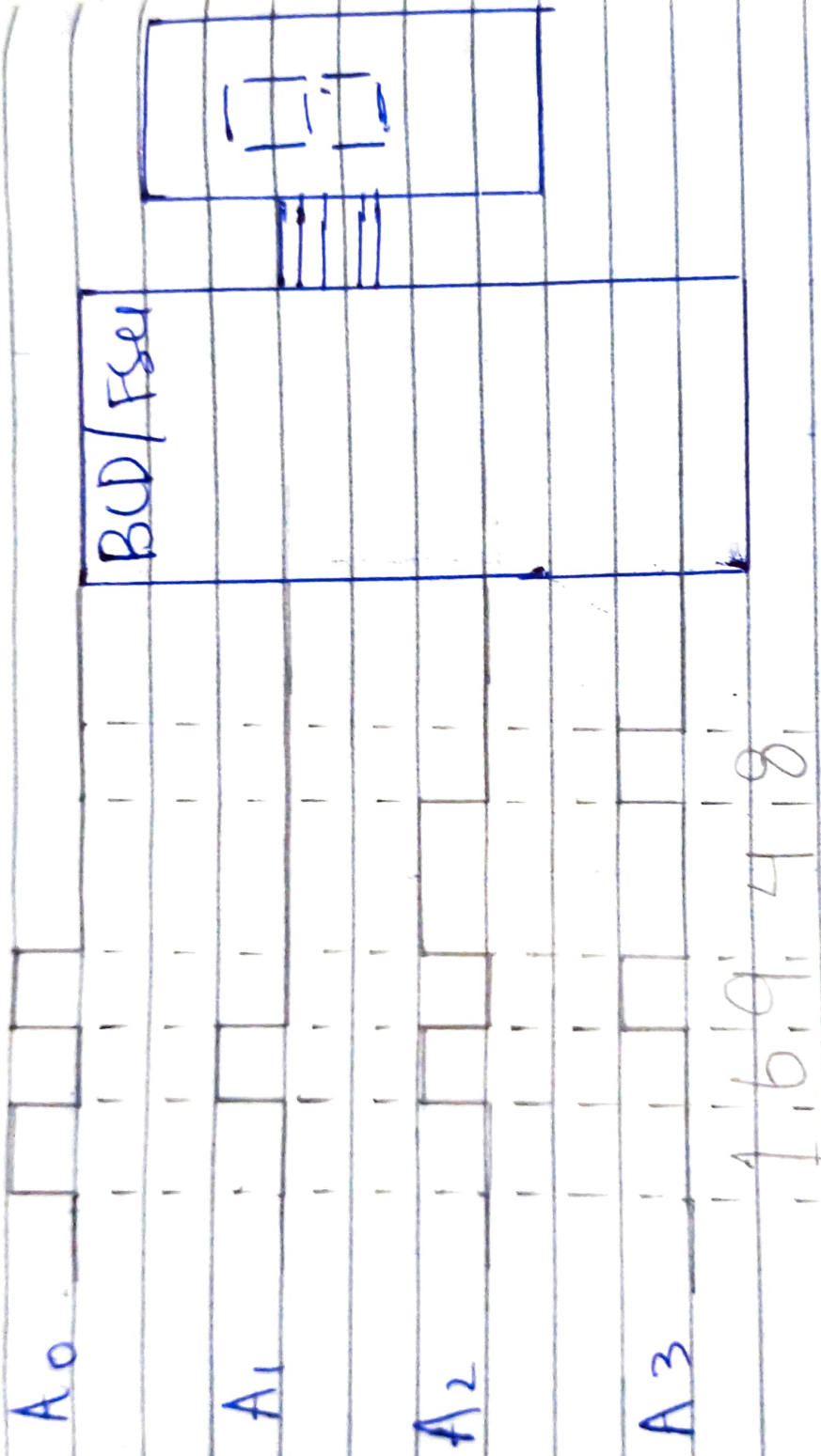
Answer

BIN / DEC	
1	1
2	2
	3
	4



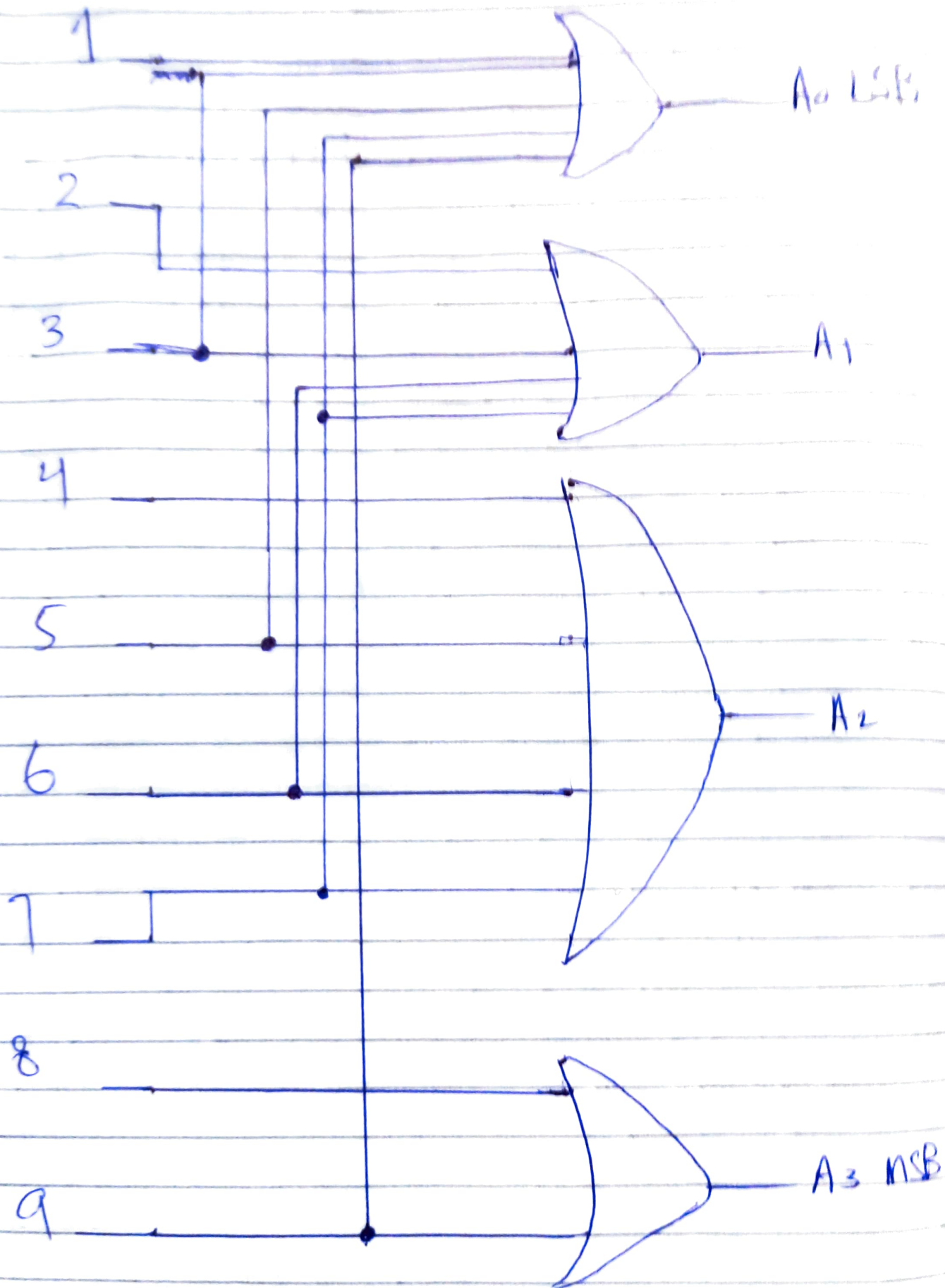
Q:13

Answer



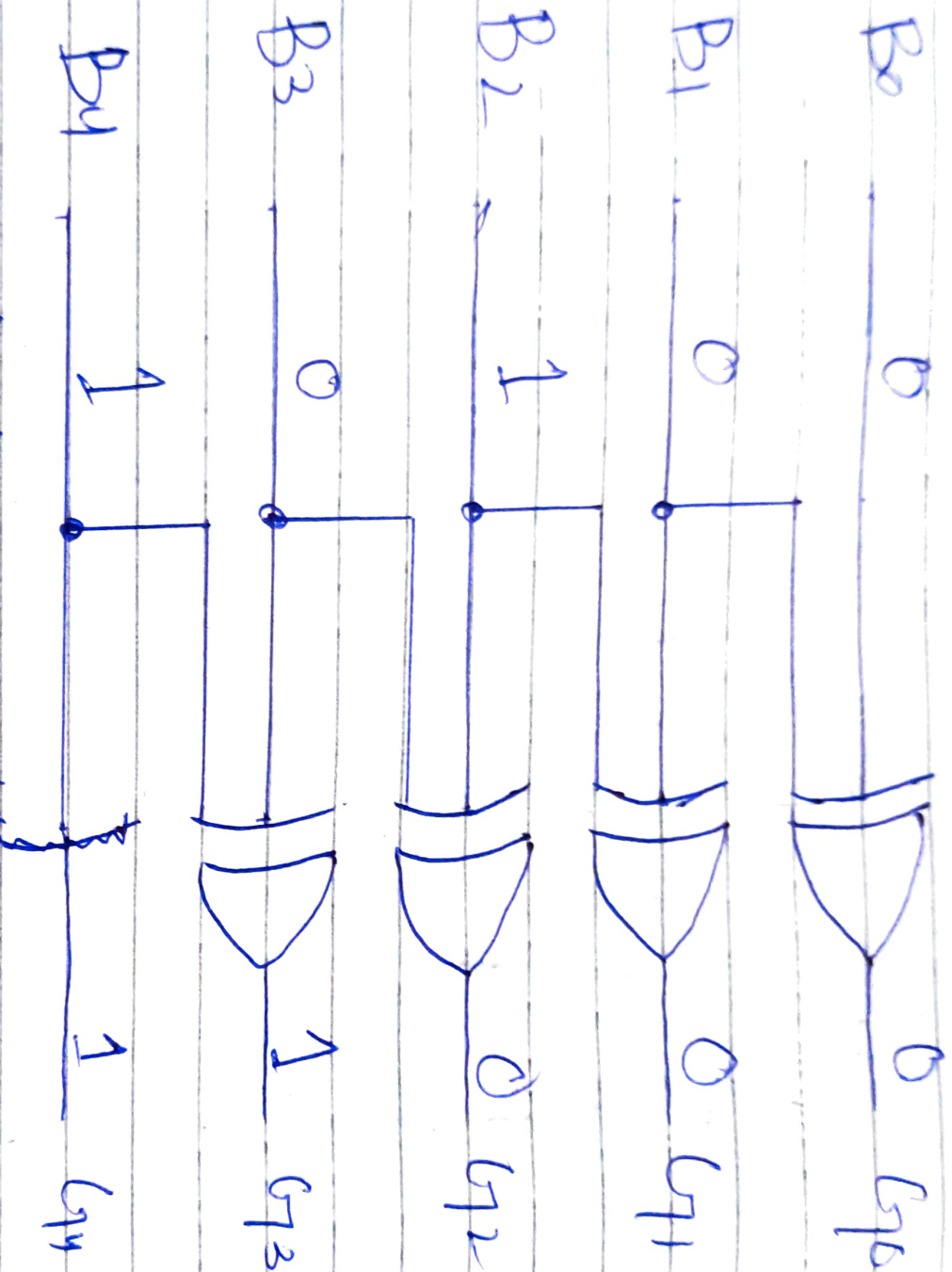
Q: 14

Answer



Q: 15

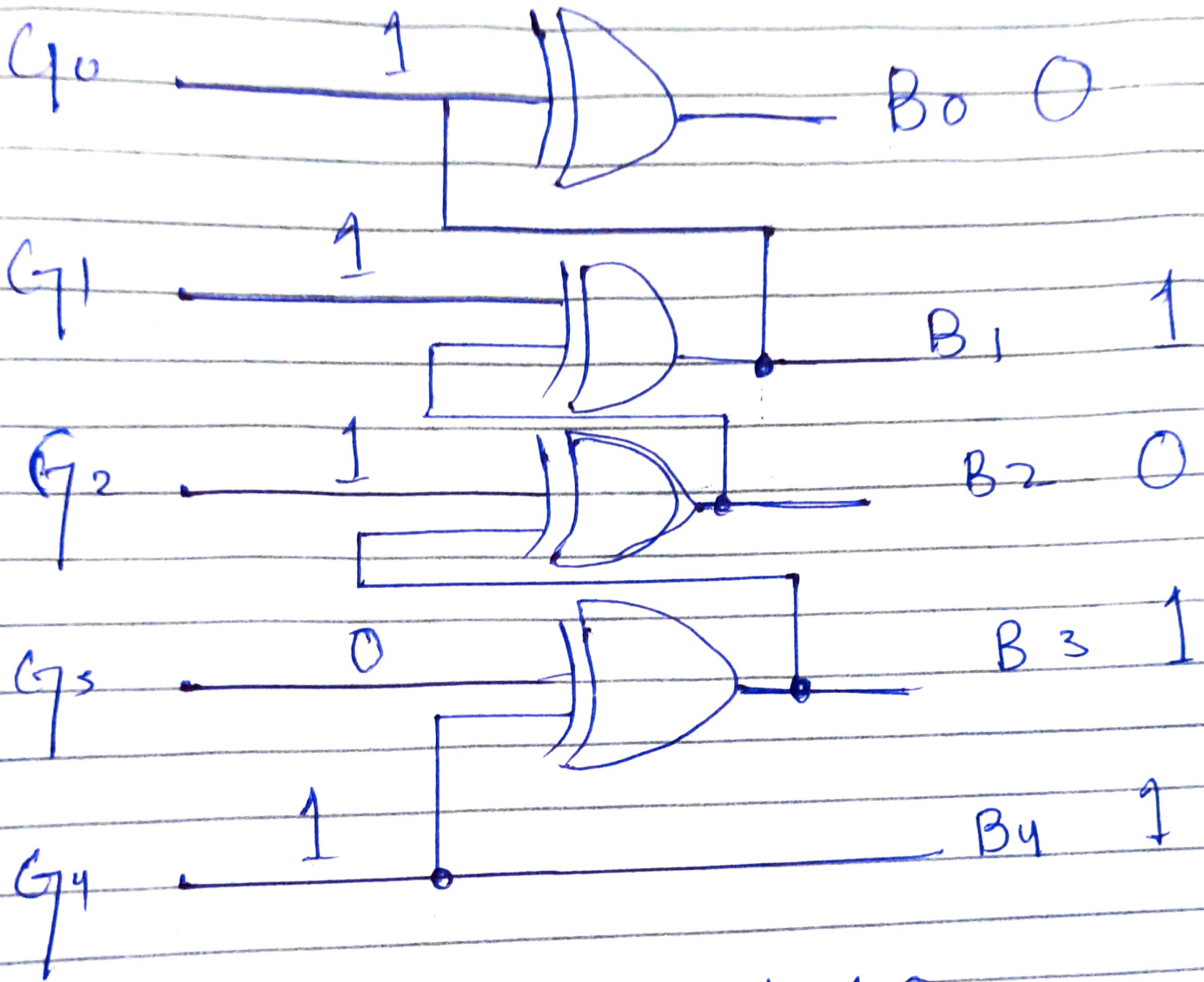
Answer.



$$10100B = 11000G$$

Q: 16

Answer

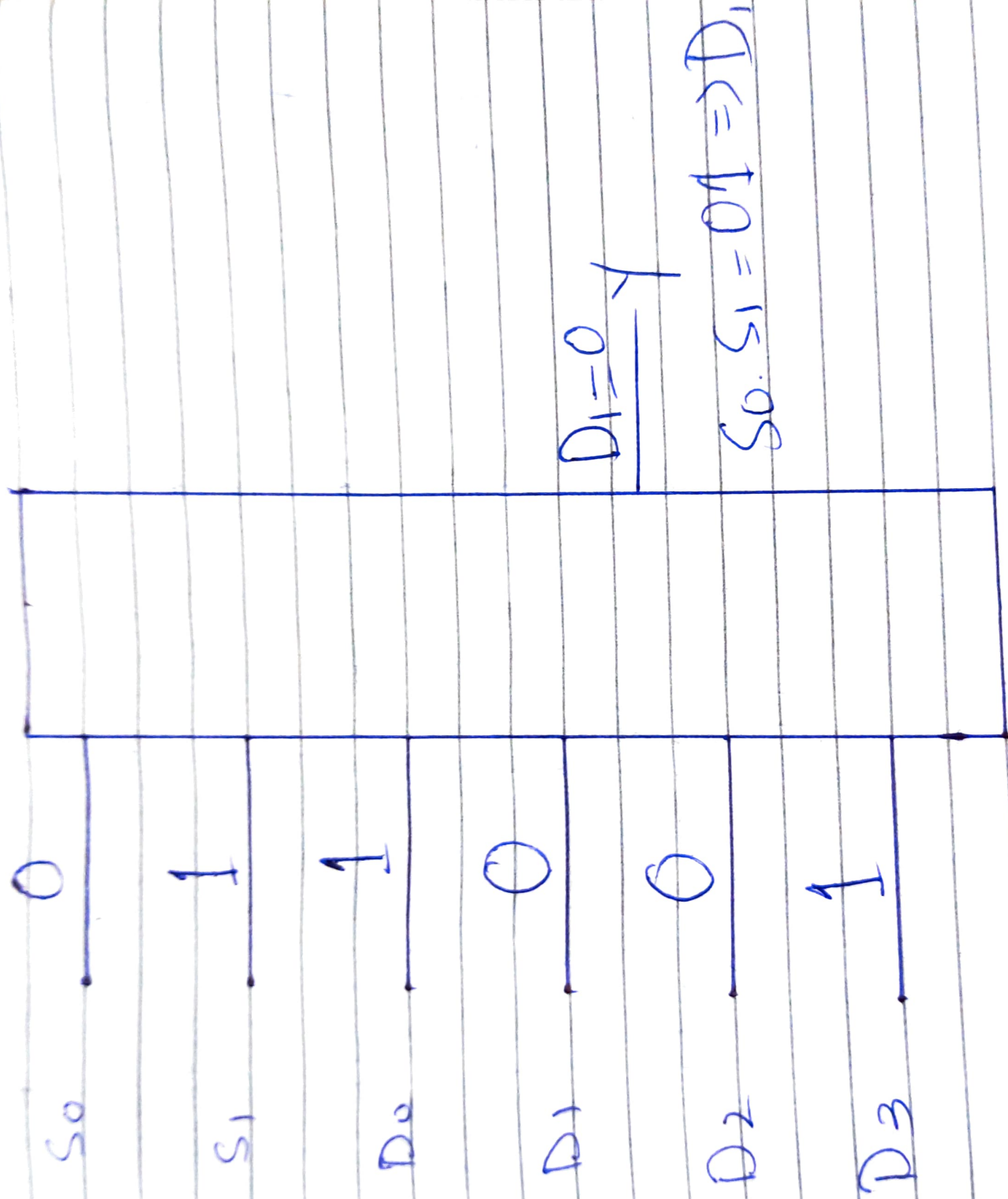


$$10111_4 = 11010_{B_1}$$

Ans

Q: 17

Answer



Q: 18

Answer.

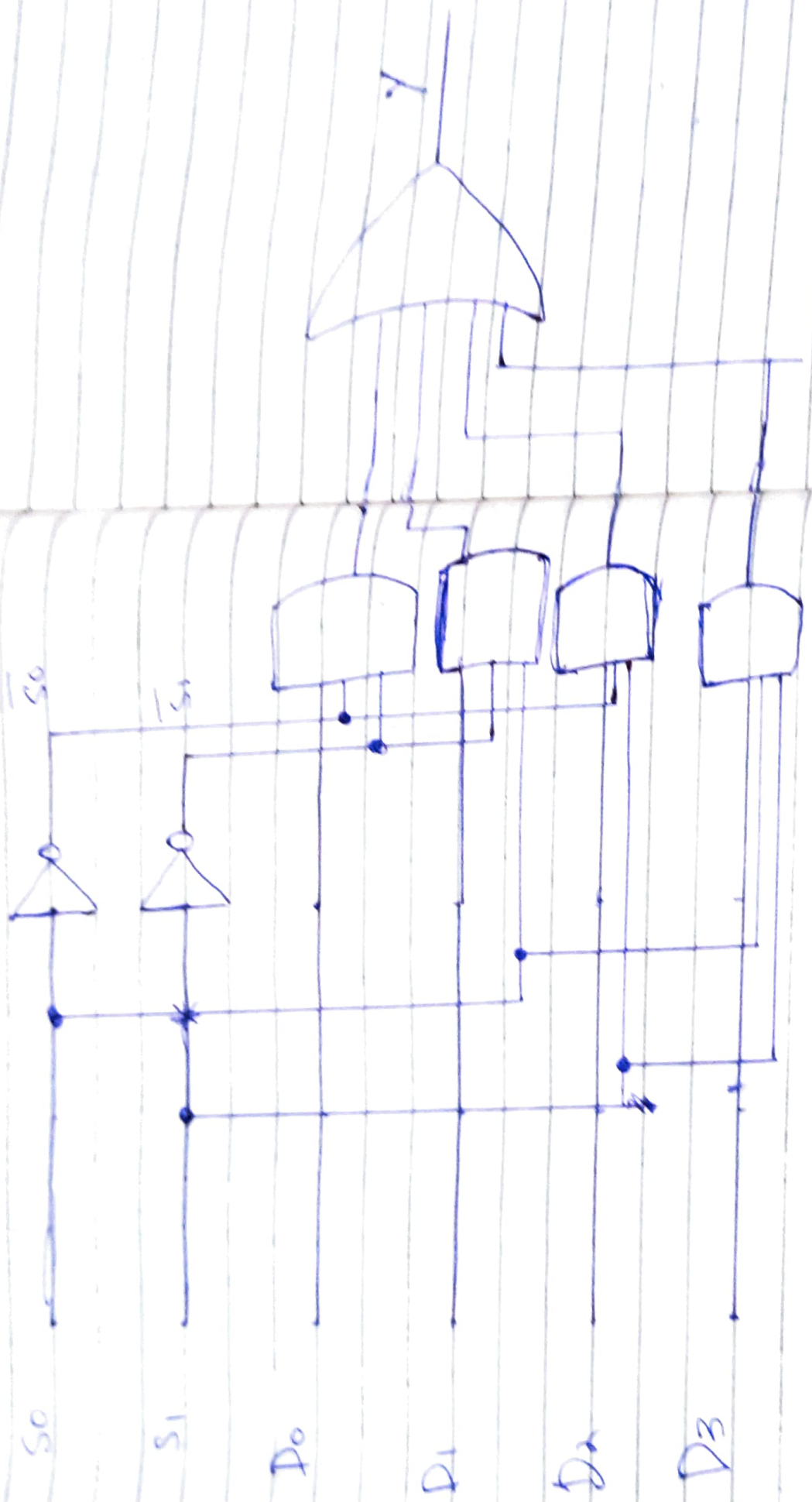
So

Si

Do, D₁, P₁, D₃, D₂, D₁, D₀, D₂, D₁, D₁, B₃, D₀

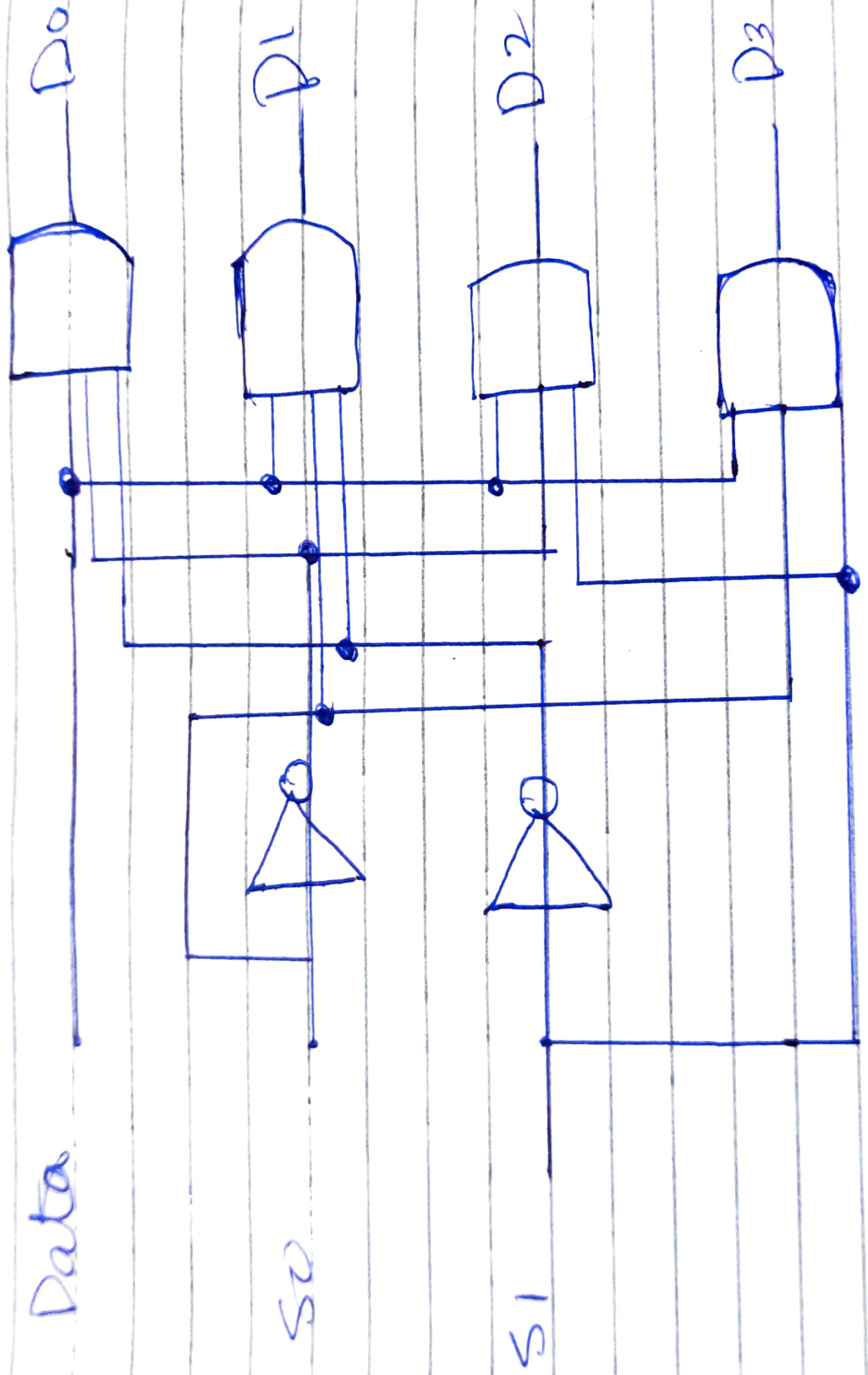
Q: 19

Answer



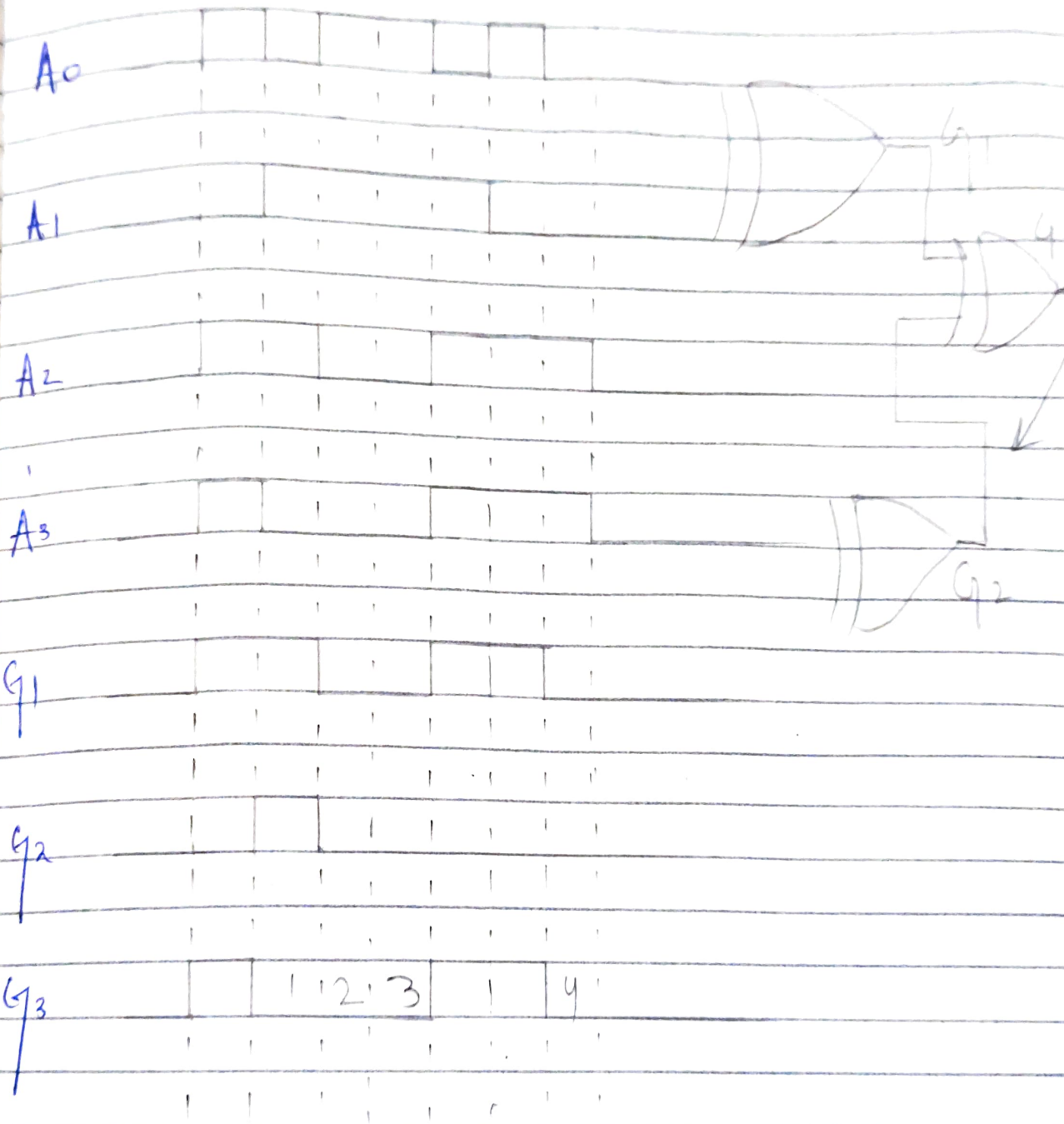
Q. 20

Answer.



Q. 21

Answer -



Even parity occurs four times and is shown by law.

Even

odd

A_0

A_1

A_2

A_3

A_n

A_5

A_6

A_7

Σ_{even}

Σ_{odd}

1

2

3

4

5

6

7

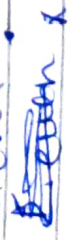
8

9

10

Σ_{even}

Σ_{odd}



Q: 23

A number

