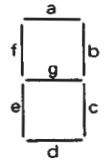
7-Segment Display Chart



102298

**DIRECTIONS:** Fill out the table below with the appropriate bits needed to create the decimal number to the left. Remember that our 7-segment displays are common anode. The first one is done for you.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Decimal Number | a | b | c | d | e | f | g |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 4 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| 5 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 6 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

Birthday Truth Table

**DIRECTIONS:** Fill out the truth table below.

You will have three inputs (A,B,C) and 7 individual outputs (a,b,c,d,e,f,g). The first column is the decimal equivalent of the 3 bit binary number you’ve made with your inputs. (Make sure they match.) The last column is for you to enter the individual digits of your birthday. You should have 6 digits. Make sure you apply Don’t Cares correctly.

Your outputs should combine to make the digit indicated by your birthday. You should be able to copy and paste the needed rows from the first table you made (above). EX: If you need a 6 copy the row corresponding to a 6 from the table above.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Decimal | A | B | C | a | b | c | d | e | f | g | Birthday |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 |
| 3 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 |
| 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 9 |
| 5 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 6 | 1 | 1 | 0 | X | X | X | X | X | X | X | X |
| 7 | 1 | 1 | 1 | X | X | X | X | X | X | X | X |

Inputs Outputs

**DIRECTIONS:** Write the individual SOP expressions for each output.

|  |  |  |
| --- | --- | --- |
| Output | | SOP |
| a | !A!B!C | |
| b | 0 | |
| c | !AB!C + !ABC | |
| d | !A!B!C | |
| e | !A!B!C + A!B!C | |
| f | !A!B!C + !AB!C + !ABC | |
| g | !A!B!C +!A!BC | |

Karnaugh Maps

1

X

0

0

X

0

0

0

X

0

X

1

0

0

X

1

X

0

0

X

0

0

X

0

0

1

1

1

0

1

0

1

0

X

1

0

0

X

1

0

0

X

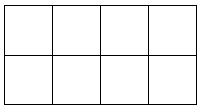
0

!A!B !AB AB A!B

!C

C

**b**



0

X

0

0

0

0

X

0

0

0

X

0

1

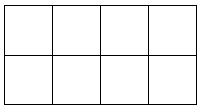
**g = !A!B**

!A!B !AB AB A!B

!C

C

**g**



**f = !AB+!A!B!C**

**e = !B!C**

**d = !A!B!C**

**c = !AB**

**b = 0  =**

**a = !A!B!C**

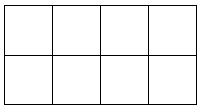
**DIRECTIONS:** Use text boxes to fill in the individual Karnaugh Maps for each of your outputs. Then find the minimal SOP expression for each.

!A!B !AB AB A!B

!C

C

**f**

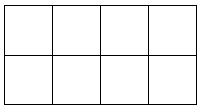


!A!B !AB AB A!B

!C

C

**e**

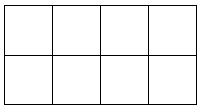


!A!B !AB AB A!B

!C

C

**c**

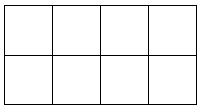


!A!B !AB AB A!B

!C

C

**d**



!A!B !AB AB A!B

!C

C

**a**

