Untuk menyelesaikan permasalahan ini maka akan digunakan truth table dan karnaugh map.

Untuk setiap segment yang dinyalakan akan dibuat karnaugh table.

Berikut merupakan truth table yang digunakan dan setiap segment dilabeli dari a sampai g

Text

Description automatically generated with medium confidence

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A | B | C | D | a | b | c | d | e | f | g |
| 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| 3 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 4 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| 5 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 6 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 7 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 8 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| 10 | 1 | 0 | 1 | 0 | x | x | x | x | x | x | x |
| 11 | 1 | 0 | 1 | 1 | x | x | x | x | x | x | x |
| 12 | 1 | 1 | 0 | 0 | x | x | x | x | x | x | x |
| 13 | 1 | 1 | 0 | 1 | x | x | x | x | x | x | x |
| 14 | 1 | 1 | 1 | 0 | x | x | x | x | x | x | x |
| 15 | 1 | 1 | 1 | 1 | x | x | x | x | x | x | x |

ABCD melambangkan biner yang ditekan. 10-15 dibuat x karena tidak akan berpengaruh pada segment. Perhitungan akan digunakan menggunakan tool <http://www.32x8.com/var4.html> agar lebih cepat.

Logic gate segment a:

Y = C + A + B’D’ + BD

A picture containing antenna

Description automatically generated

Logic gate segment b:

Y = B’ + C’D’ + CD

Diagram

Description automatically generated

Logic gate segment c:

Y = C’ + D + B

A picture containing antenna

Description automatically generated

Logic gate segment d:

Y = A + B’D’ + B’C + CD’ + BC’D

A picture containing black, antenna

Description automatically generated

Logic gate segment e:

Y = B’D’ + CD’

A picture containing text, antenna, clock

Description automatically generated

Logic gate segment f:

Y = A + C’D’ + BC’ + BD’

A picture containing text, antenna

Description automatically generated

Logic gate segment g:

Y = A + B’C + CD’ + BC’

Diagram

Description automatically generated