Ministerul Educației, Culturii și Cercetării al Republicii Moldova

Universitatea Tehnică a Moldovei

Facultatea Calculatoare, Informatică și Microelectronică

**Raport la**

**Lucrarea de laborator Nr. 3**

*Disciplina: Analiza şi sinteza dispozitivelor numerice*

#### Tema: ”Sinteza decodificatoarelor şi codificatoarelor”

A efectuat: Rosca Dorin, TI-216

A verificat: Gheorghe Tutuianu

Chișinău – 2022

#### Scopul lucrării: studierea practică a structurii şi a metodelor de sinteză a decodificatoarelor şi codificatoarelor.

Sarcina

#### Efectuaţi sinteza unui **decodificator binar-zecimal pe 7 segmente** conform variantei din tabelul 2.6 ( la indicaţia profesorului), **în baza porților logice ȘI-NU**. 2.   Efectuaţi sinteza unui codificator binar-zecimal conform variantei **în baza porților logice ȘI-NU**

#### **Varianta 14:**

|  |  |  |
| --- | --- | --- |
| Nr. crt. | Codul binar-zecimal | |
| Decodifi-cator | Codificator |
| 14. | 8 4 1 (-6) | 5 3 2 (-1) |

Elaborarea Codificatorului:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cifra Zeciamala | Intrarile | | | | | | | | | | Iesirile | | | |
| *5* | *3* | *2* | *-1* |
|  |  |  |  |  |  |  |  |  |  | *f4* | *f3* | *f2* | *f1* |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |

Expresiile logice:

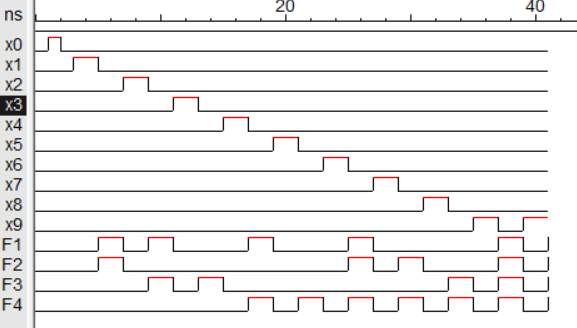
Schema Logica:



T=2[ԏ](https://ru.wikipedia.org/wiki/%D4%8E)

C=29Q

Diagrama de timp:



Elaborarea Decodificatorului:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cifra Zecimala | Codul | | | | DC 7 segmente | | | | | | |
| 8 4 1 -6 | | | |
| *x1* | *x2* | *x3* | *x4* | *a* | *b* | *c* | *d* | *e* | *f* | g |
| 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| 3 | 1 | 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 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 6 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 7 | 1 | 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 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
|  | 0 | 0 | 0 | 1 | \* | \* | \* | \* | \* | \* | \* |
|  | 0 | 0 | 1 | 1 | \* | \* | \* | \* | \* | \* | \* |
|  | 0 | 1 | 1 | 1 | \* | \* | \* | \* | \* | \* | \* |
|  | 1 | 1 | 0 | 0 | \* | \* | \* | \* | \* | \* | \* |
|  | 1 | 1 | 1 | 0 | \* | \* | \* | \* | \* | \* | \* |
|  | 0 | 1 | 0 | 1 | \* | \* | \* | \* | \* | \* | \* |

Diagramma Karnaugh pentru a:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x1x2  x3x4 | 00 | 01 | 11 | 10 |
| 00 | 1 |  | \* | 1 |
| 01 | \* | \* | 1 | 1 |
| 11 | \* | \* | 1 | 1 |
| 10 |  | 1 | \* | 1 |

Diagramma Karnaugh pentru b:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x1x2  x3x4 | 00 | 01 | 11 | 10 |
| 00 | 1 | 1 | \* | 1 |
| 01 | \* | \* |  | 1 |
| 11 | \* | \* | 1 | 1 |
| 10 | 1 |  | \* | 1 |

Diagramma Karnaugh pentru c:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x1x2  x3x4 | 00 | 01 | 11 | 10 |
| 00 | 1 | 1 | \* | 1 |
| 01 | \* | \* | 1 |  |
| 11 | \* | \* | 1 | 1 |
| 10 | 1 | 1 | \* | 1 |

Diagramma Karnaugh pentru d:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x1x2  x3x4 | 00 | 01 | 11 | 10 |
| 00 | 1 |  | \* | 1 |
| 01 | \* | \* | 1 | 1 |
| 11 | \* | \* |  | 1 |
| 10 |  | 1 | \* | 1 |

Diagramma Karnaugh pentru e:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x1x2  x3x4 | 00 | 01 | 11 | 10 |
| 00 | 1 |  | \* | 1 |
| 01 | \* | \* | 1 | 1 |
| 11 | \* | \* |  |  |
| 10 |  |  | \* |  |

Diagramma Karnaugh pentru f:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x1x2  x3x4 | 00 | 01 | 11 | 10 |
| 00 | 1 | 1 | \* | 1 |
| 01 | \* | \* | 1 |  |
| 11 | \* | \* |  |  |
| 10 |  | 1 | \* | 1 |

Diagramma Karnaugh pentru g:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x1x2  x3x4 | 00 | 01 | 11 | 10 |
| 00 |  | 1 | \* | 1 |
| 01 | \* | \* | 1 | 1 |
| 11 | \* | \* |  | 1 |
| 10 |  | 1 | \* | 1 |

**z=**

**v=**

**x=**

**n=**

Schema Logica:



T=2[ԏ](https://ru.wikipedia.org/wiki/%D4%8E)

C= 39 Q

Concluzie:

In urma lucrarii de laborator 3.Am studiat structurile si metodele de sinteza a codificatorului si decodificatorului;