Министерство науки и высшего образования Российской Федерации

Федеральное государственное автономное образовательное учреждение высшего образования

«Национальный исследовательский университет ИТМО»

*Факультет Программной инженерии и компьютерной техники*

**Курсовая работа 2 часть**

по дисциплине “Дискретная математика”

Вариант № 33

Группа: P3133

Выполнил(а): Агадилова М.К.

Проверил(а):Поляков В.И.

Санкт-Петербург

2021г

**C=A**±**B** 

**y=0 для C=A+B,**

**y=1 для C=A-B.**

**1.Таблица истинности**

**​​**

| **№** | **y** | **A1** | **A2** | **B1** | **B2** | **C1** | **C2** | **C3** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| **2** | **0** | **0** | **0** | **0** | **1** | **0** | **0** | **1** |
| **3** | **0** | **0** | **0** | **1** | **0** | **0** | **1** | **0** |
| **4** | **0** | **0** | **0** | **1** | **1** | **0** | **1** | **1** |
| **5** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **1** |
| **6** | **0** | **0** | **1** | **0** | **1** | **0** | **1** | **0** |
| **7** | **0** | **0** | **1** | **1** | **0** | **0** | **1** | **1** |
| **8** | **0** | **0** | **1** | **1** | **1** | **1** | **0** | **0** |
| **9** | **0** | **1** | **0** | **0** | **0** | **0** | **1** | **0** |
| **10** | **0** | **1** | **0** | **0** | **1** | **0** | **1** | **1** |
| **11** | **0** | **1** | **0** | **1** | **0** | **1** | **0** | **0** |
| **12** | **0** | **1** | **0** | **1** | **1** | **1** | **0** | **1** |
| **13** | **0** | **1** | **1** | **0** | **0** | **0** | **1** | **1** |
| **14** | **0** | **1** | **1** | **0** | **1** | **1** | **0** | **0** |
| **15** | **0** | **1** | **1** | **1** | **0** | **1** | **0** | **1** |
| **16** | **0** | **1** | **1** | **1** | **1** | **1** | **1** | **0** |
| **17** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| **18** | **1** | **0** | **0** | **0** | **1** | **1** | **1** | **1** |
| **19** | **1** | **0** | **0** | **1** | **0** | **1** | **1** | **0** |
| **20** | **1** | **0** | **0** | **1** | **1** | **1** | **0** | **1** |
| **21** | **1** | **0** | **1** | **0** | **0** | **0** | **0** | **1** |
| **22** | **1** | **0** | **1** | **0** | **1** | **0** | **0** | **0** |
| **23** | **1** | **0** | **1** | **1** | **0** | **1** | **1** | **1** |
| **24** | **1** | **0** | **1** | **1** | **1** | **1** | **1** | **0** |
| **25** | **1** | **1** | **0** | **0** | **0** | **0** | **1** | **0** |
| **26** | **1** | **1** | **0** | **0** | **1** | **0** | **0** | **1** |
| **27** | **1** | **1** | **0** | **1** | **0** | **0** | **0** | **0** |
| **28** | **1** | **1** | **0** | **1** | **1** | **1** | **1** | **1** |
| **29** | **1** | **1** | **1** | **0** | **0** | **0** | **1** | **1** |
| **30** | **1** | **1** | **1** | **0** | **1** | **0** | **1** | **0** |
| **31** | **1** | **1** | **1** | **1** | **0** | **0** | **0** | **1** |
| **32** | **1** | **1** | **1** | **1** | **1** | **0** | **0** | **0** |

**2.Минимизация булевых функций системы**

|  | B1B2 | | | | |
| --- | --- | --- | --- | --- | --- |
| A1A2 |  | 00 | 01 | 11 | 10 |
| 00 |  |  |  |  |
| 01 |  |  | 1 |  |
| 11 |  | 1 | 1 | 1 |
| 10 |  |  | 1 | 1 |
| y=0 | | | | |

|  | B1B2 | | | | |
| --- | --- | --- | --- | --- | --- |
| A1A2 |  | 00 | 01 | 11 | 10 |
| 00 |  | 1 | 1 | 1 |
| 01 |  |  | 1 | 1 |
| 11 |  |  |  |  |
| 10 |  |  | 1 |  |
| y=1 | | | | |

*Cmin (C1) = {10X1X, 01X1X,1X011, 100X1, 011X1, 0X111}, Sa = 22, Sb =28.*

*C1 =*

|  | B1B2 | | | | |
| --- | --- | --- | --- | --- | --- |
| A1A2 |  | 00 | 01 | 11 | 10 |
| 00 |  |  | 1 | 1 |
| 01 |  | 1 |  | 1 |
| 11 | 1 |  | 1 |  |
| 10 | 1 | 1 |  |  |
| y=0 | | | | |

|  | B1B2 | | | | |
| --- | --- | --- | --- | --- | --- |
| A1A2 |  | 00 | 01 | 11 | 10 |
| 00 |  | 1 |  | 1 |
| 01 |  |  | 1 | 1 |
| 11 | 1 | 1 |  |  |
| 10 | 1 |  | 1 |  |
| y=1 | | | | |

*Cmin (C2) = {X1X00, X0X10,1110X, 1011X, 0100X, 0001X, 11011, 10001, 01111, 00101}, Sa = 42, Sb =52.*

*C2 =*

|  |  | B1B2 |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | 00 | 01 | 11 | 10 |
| A1A2 | 00 |  | 1 | 1 |  |
|  | 01 | 1 |  |  | 1 |
|  | 11 | 1 |  |  | 1 |
|  | 10 |  | 1 | 1 |  |
|  |  |  | y=0 |  |  |

|  |  | B1B2 |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | 00 | 01 | 11 | 10 |
| A1A2 | 00 |  | 1 | 1 |  |
|  | 01 | 1 |  |  | 1 |
|  | 11 | 1 |  |  | 1 |
|  | 10 |  | 1 | 1 |  |
|  |  |  | y=1 |  |  |

*Cmin (C3) = {XX1X0,XX0X1}, Sa = 4, Sb =6.*

*C3 =*



*C1 = ( = 23)*

*C2 = ( = 53)*

*C3 = ( = 5)*



*( = 2)*

*( = 3)*

*( = 2)*

*C1 = ( = 21)*

*C2 = ( = 40)*

*C3 = ( = 4)*

*В результате цена схемы уменьшилась до SQ=72.*

*3. Синтез схем*









