

Задача 8.

Для данной булевой функции g найти сокращенную ДНФ:

а) методом Квайна;

б) с помощью карты Карно.

Задача 9.

Для данной булевой функции h найти сокращенную ДНФ методом Блейка.

Задача 10.

Для данной булевой функции k найти

а) сокращенную ДНФ по алгоритму Нельсона,

б) с помощью карты Карно.

Задача 11.

Найти все тупиковые и минимальные ДНФ для любой из функций f , g , h , k из задач 8, 9, 10.

К задачам № 8,9.

1. $g = (1,1,1,1,1,1,0,0,0,0,0,0,0,0,1,1)$; $h = x_1x_2 \vee \bar{x}_1\bar{x}_3 \vee x_1x_4 \vee \bar{x}_2\bar{x}_3\bar{x}_4$;
2. $g = (1,1,1,1,1,1,0,0,0,0,0,0,0,1,0,1)$; $h = x_1x_4 \vee \bar{x}_2\bar{x}_3 \vee x_1\bar{x}_4 \vee \bar{x}_1x_2x_3$;
3. $g = (1,1,1,1,1,1,0,0,0,0,0,0,0,1,1,0)$; $h = x_2\bar{x}_1 \vee x_1x_3 \vee \bar{x}_2x_4 \vee x_1\bar{x}_3\bar{x}_4$;
4. $g = (1,1,1,1,1,1,0,0,0,0,0,0,1,0,0,1)$; $h = \bar{x}_1x_3 \vee x_1x_4 \vee \bar{x}_2\bar{x}_3 \vee x_1x_2\bar{x}_4$;
5. $g = (1,1,1,1,1,1,0,0,0,0,0,0,1,0,1,0)$; $h = x_1x_3 \vee \bar{x}_2x_4 \vee \bar{x}_3x_4 \vee x_1x_2x_4$;
6. $g = (1,1,1,1,1,1,0,0,0,0,0,0,1,1,0,0)$; $h = \bar{x}_2x_4 \vee x_1x_2 \vee \bar{x}_3\bar{x}_4 \vee \bar{x}_1x_3x_4$;
7. $g = (1,1,1,1,1,1,0,0,0,0,0,1,0,0,0,1)$; $h = \bar{x}_2\bar{x}_3 \vee x_1\bar{x}_4 \vee \bar{x}_1x_2 \vee x_1x_3x_4$;
8. $g = (1,1,1,1,1,1,0,0,0,0,0,1,0,0,1,0)$; $h = x_1x_2 \vee \bar{x}_3\bar{x}_4 \vee \bar{x}_1x_3 \vee x_1\bar{x}_2x_4$;
9. $g = (1,1,1,1,1,1,0,0,0,0,0,1,0,1,0,0)$; $h = x_1\bar{x}_4 \vee \bar{x}_1x_2 \vee x_1x_3 \vee \bar{x}_2\bar{x}_3x_4$;
10. $g = (1,1,1,1,1,1,0,0,0,0,0,1,1,0,0,0)$; $h = x_1 \vee \bar{x}_1x_2 \vee x_1x_3x_4 \vee \bar{x}_2\bar{x}_3\bar{x}_4$;
11. $g = (1,1,1,1,1,1,0,0,0,0,1,0,0,0,0,1)$; $h = x_2 \vee \bar{x}_1x_3 \vee x_1\bar{x}_2x_4 \vee x_1\bar{x}_3\bar{x}_4$;
12. $g = (1,1,1,1,1,1,0,0,0,0,1,0,0,0,1,0)$; $h = x_3 \vee x_1x_4 \vee \bar{x}_2\bar{x}_3x_4 \vee x_1x_2\bar{x}_4$;
13. $g = (1,1,1,1,1,1,0,0,0,0,1,0,0,1,0,0)$; $h = x_1x_3 \vee \bar{x}_2\bar{x}_4 \vee \bar{x}_1x_2 \vee x_1\bar{x}_3x_4$;
14. $g = (1,1,1,1,1,1,0,0,0,0,1,0,1,0,0,0)$; $h = x_1x_2 \vee \bar{x}_3\bar{x}_4 \vee \bar{x}_1x_4 \vee x_1\bar{x}_2x_3$;
15. $g = (1,1,1,1,1,1,0,0,0,0,1,1,0,0,0,0)$; $h = x_1x_4 \vee \bar{x}_2\bar{x}_3 \vee \bar{x}_1x_3 \vee x_1x_2\bar{x}_4$;
16. $g = (1,1,1,1,1,1,0,0,0,1,0,0,0,0,0,1)$; $h = x_2x_4 \vee \bar{x}_1\bar{x}_3 \vee \bar{x}_3x_4 \vee x_1\bar{x}_2x_4$;
17. $g = (1,1,1,1,1,1,0,0,0,1,0,0,0,0,1,0)$; $h = x_2x_3 \vee \bar{x}_1\bar{x}_4 \vee x_1\bar{x}_3 \vee \bar{x}_3x_2x_4$;
18. $g = (1,1,1,1,1,1,0,0,0,1,0,0,0,1,0,0)$; $h = x_1x_2 \vee \bar{x}_3\bar{x}_4 \vee \bar{x}_2x_3 \vee \bar{x}_1x_2x_4$;
19. $g = (1,1,1,1,1,1,0,0,0,1,0,0,1,0,0,0)$; $h = x_2x_3 \vee \bar{x}_1\bar{x}_4 \vee \bar{x}_2x_1 \vee x_2\bar{x}_3x_4$;
20. $g = (1,1,1,1,1,1,0,0,0,1,0,1,0,0,0,0)$; $h = x_1x_3 \vee \bar{x}_2\bar{x}_4 \vee \bar{x}_3x_2 \vee x_3\bar{x}_1x_4$.

К задаче № 10.

1. $k = (\bar{x}_1 \vee x_2) \wedge (x_1 \vee x_3) \wedge (x_2 \vee x_4) \wedge (x_3 \vee x_4) \wedge (x_1 \vee \bar{x}_2 \vee \bar{x}_3 \vee x_4)$;

2. $k = (\bar{x}_2 \vee x_1) \wedge (x_2 \vee x_3) \wedge (x_1 \vee x_4) \wedge (x_3 \vee x_4) \wedge (\bar{x}_1 \vee \bar{x}_2 \vee \bar{x}_3 \vee x_4);$
3. $k = (\bar{x}_3 \vee x_2) \wedge (x_1 \vee x_3) \wedge (x_2 \vee x_4) \wedge (x_1 \vee x_4) \wedge (\bar{x}_1 \vee \bar{x}_2 \vee x_3 \vee x_4);$
4. $k = (\bar{x}_4 \vee x_2) \wedge (x_3 \vee x_4) \wedge (x_1 \vee x_2) \wedge (x_1 \vee x_3) \wedge (x_1 \vee \bar{x}_2 \vee \bar{x}_3 \vee x_4);$
5. $k = (\bar{x}_1 \vee x_3) \wedge (x_1 \vee x_2) \wedge (x_3 \vee x_4) \wedge (x_2 \vee x_4) \wedge (x_1 \vee \bar{x}_2 \vee \bar{x}_3 \vee x_4);$
6. $k = (\bar{x}_1 \vee x_4) \wedge (x_1 \vee x_3) \wedge (x_2 \vee x_4) \wedge (x_2 \vee x_3) \wedge (x_1 \vee \bar{x}_2 \vee x_3 \vee \bar{x}_4);$
7. $k = (\bar{x}_1 \vee x_2) \wedge (x_1 \vee x_4) \wedge (x_2 \vee x_3) \wedge (x_3 \vee x_4) \wedge (x_1 \vee \bar{x}_2 \vee x_3 \vee \bar{x}_4);$
8. $k = (\bar{x}_2 \vee x_3) \wedge (x_1 \vee x_2) \wedge (x_3 \vee x_4) \wedge (x_1 \vee x_4) \wedge (\bar{x}_1 \vee \bar{x}_2 \vee \bar{x}_3 \vee x_4);$
9. $k = (\bar{x}_3 \vee x_1) \wedge (x_2 \vee x_3) \wedge (x_1 \vee x_4) \wedge (x_2 \vee x_4) \wedge (\bar{x}_1 \vee \bar{x}_2 \vee x_3 \vee x_4);$
10. $k = (\bar{x}_2 \vee x_4) \wedge (x_2 \vee x_3) \wedge (x_1 \vee x_4) \wedge (x_1 \vee x_3) \wedge (x_1 \vee x_2 \vee \bar{x}_3 \vee \bar{x}_4);$
11. $k = (\bar{x}_4 \vee x_1) \wedge (x_3 \vee x_4) \wedge (x_1 \vee x_2) \wedge (x_2 \vee x_3) \wedge (\bar{x}_1 \vee \bar{x}_2 \vee \bar{x}_3 \vee x_4);$
12. $k = (\bar{x}_3 \vee x_2) \wedge (x_3 \vee x_4) \wedge (x_1 \vee x_2) \wedge (x_1 \vee x_3) \wedge (x_1 \vee \bar{x}_2 \vee x_3 \vee \bar{x}_4);$
13. $k = (\bar{x}_4 \vee x_2) \wedge (x_1 \vee x_4) \wedge (x_2 \vee x_3) \wedge (x_1 \vee x_3) \wedge (\bar{x}_1 \vee \bar{x}_2 \vee x_3 \vee x_4);$
14. $k = (\bar{x}_1 \vee x_3) \wedge (x_1 \vee x_4) \wedge (x_2 \vee x_3) \wedge (x_2 \vee x_4) \wedge (x_1 \vee x_2 \vee \bar{x}_3 \vee \bar{x}_4);$
15. $k = (\bar{x}_1 \vee x_4) \wedge (x_1 \vee x_2) \wedge (x_3 \vee x_4) \wedge (x_2 \vee x_3) \wedge (x_1 \vee \bar{x}_2 \vee x_3 \vee \bar{x}_4);$
16. $k = (\bar{x}_2 \vee x_3) \wedge (x_2 \vee x_4) \wedge (x_1 \vee x_3) \wedge (x_1 \vee x_4) \wedge (x_1 \vee x_2 \vee \bar{x}_3 \vee \bar{x}_4);$
17. $k = (\bar{x}_3 \vee x_4) \wedge (x_1 \vee x_3) \wedge (x_2 \vee x_4) \wedge (x_1 \vee x_2) \wedge (\bar{x}_1 \vee \bar{x}_2 \vee x_3 \vee \bar{x}_4);$
18. $k = (\bar{x}_4 \vee x_1) \wedge (x_2 \vee x_4) \wedge (x_1 \vee x_3) \wedge (x_2 \vee x_3) \wedge (\bar{x}_1 \vee \bar{x}_2 \vee x_3 \vee x_4);$
19. $k = (\bar{x}_3 \vee x_4) \wedge (x_2 \vee x_3) \wedge (x_1 \vee x_4) \wedge (x_1 \vee x_2) \wedge (x_1 \vee \bar{x}_2 \vee x_3 \vee \bar{x}_4);$
20. $k = (\bar{x}_2 \vee x_1) \wedge (x_2 \vee x_4) \wedge (x_1 \vee x_3) \wedge (x_3 \vee x_4) \wedge (\bar{x}_1 \vee \bar{x}_2 \vee x_3 \vee \bar{x}_4).$

