Вариант – 26

Задание 8. Метод ветвей и границ.

Найти кратчайшее и минимальное покрытия (задания 6 и 7), используя метод ветвей и границ.

Таблица из задания 6.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R | b1 | b2 | b3 | b4 | b5 | b6 | b7 | b8 | b9 | b10 |
| A |  | 1 |  |  |  | 1 |  |  | 1 |  |
| B | 1 |  | 1 |  |  |  |  |  |  |  |
| C |  |  |  |  | 1 |  | 1 |  |  |  |
| D | 1 |  |  |  |  |  |  | 1 |  |  |
| E |  | 1 | 1 |  | 1 |  | 1 |  |  |  |
| F |  |  |  | 1 |  | 1 |  | 1 |  | 1 |
| G |  |  |  |  | 1 |  |  |  | 1 |  |
| H |  |  | 1 |  |  | 1 | 1 |  |  | 1 |
| ОБ=3+0=3 | | | | | | | | | | |

Данная таблица не требует разложения, так как полностью сокращается, а значит нет смысла решать ее методом ветвей и границ.

Таблица из задания 7.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R | b1 | b2 | b3 | b4 | b5 | b6 | b7 | b8 | b9 | c |
| A | 1 | 1 |  |  |  |  | 1 |  |  | 2 |
| B |  |  |  | 1 | 1 |  |  |  | 1 | 2 |
| C |  |  |  | 1 |  | 1 | 1 | 1 |  | 2 |
| D |  | 1 |  |  |  | 1 |  |  | 1 | 1 |
| E | 1 |  | 1 | 1 |  | 1 |  |  |  | 3 |
| F |  |  | 1 |  | 1 |  |  | 1 |  | 1 |
| G |  | 1 |  |  | 1 |  | 1 | 1 | 1 | 4 |
| H |  | 1 |  |  |  | 1 |  |  |  | 3 |

ОБ=2+0=2

ОБМ=1+1=2

Разл. по ст. 1 {A} (2) и {E} (3)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| {A}(2) |  |  |  |  |  |  |  |  | {E} (3) |  |  |  |  |  |  |
| R | b3 | b4 | b5 | b6 | b8 | b9 | c |  | R | b2 | b5 | b7 | b8 | b9 | c |
| B |  | 1 | 1 |  |  |  | 2 |  | A | 1 |  | 1 |  |  | 2 |
| C |  | 1 |  | 1 | 1 |  | 2 |  | B |  | 1 |  |  | 1 | 2 |
| D |  |  |  | 1 |  | 1 | 1 |  | C |  |  | 1 | 1 |  | 2 |
| E | 1 | 1 |  | 1 |  |  | 3 |  | D | 1 |  |  |  | 1 | 1 |
| F | 1 |  | 1 |  | 1 |  | 1 |  | F |  | 1 |  | 1 |  | 1 |
| G |  |  | 1 |  | 1 | 1 | 4 |  | G | 1 | 1 | 1 | 1 | 1 | 4 |
| H |  |  |  | 1 |  |  | 3 |  | H | 1 |  |  |  |  | 3 |
| ОБ=2+1=3  ОБМ=1+1+1+2=5 | | | | | | | |  | ОБ=1+1=2  ОБМ=1+1+3=5 | | | | | | |
| {A}(2) | |  |  |  |  |  |  |  | {E} (3) | |  |  |  |  |  |
| R | b3 | b4 | b5 | b6 | b8 | b9 | c |  | R | b2 | b5 | b7 | b8 | b9 | c |
| B |  | 1 | 1 |  |  |  | 2 |  | A | 1 |  | 1 |  |  | 2 |
| C |  | 1 |  | 1 | 1 |  | 2 |  | B |  | 1 |  |  | 1 | 2 |
| D |  |  |  | 1 |  | 1 | 1 |  | C |  |  | 1 | 1 |  | 2 |
| E | 1 | 1 |  | 1 |  |  | 3 |  | D | 1 |  |  |  | 1 | 1 |
| F | 1 |  | 1 |  | 1 |  | 1 |  | F |  | 1 |  | 1 |  | 1 |
| G |  |  | 1 |  | 1 | 1 | 4 |  | G | 1 | 1 | 1 | 1 | 1 | 4 |
| ОБ=2+1=3  ОБМ=1+1+1+2=5 | | | | | | | |  | ОБ=1+1=2  ОБМ=1+3=4 | | | | | | |
| Разл. по ст. b3 {E} (3) и {F} (1) | | | | | | | |  | {E,G} - кратчайшее решение | | | | | | |
|  | | | | | | | |  | S=3+4=7 | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | |  |  | | | | |
| {E} (3) | | | | |  | {F} (1) | | | | |
| R | b5 | b8 | b9 | c | 1 | R | b4 | b6 | b9 | c |
| B | 1 |  |  | 2 | 3 | B | 1 |  |  | 2 |
| C |  | 1 |  | 2 |  | C | 1 | 1 |  | 2 |
| D |  |  | 1 | 1 |  | D |  | 1 | 1 | 1 |
| F | 1 | 1 |  | 1 | 2 | E | 1 | 1 |  | 3 |
| G | 1 | 1 | 1 | 4 |  | G |  |  | 1 | 4 |
| ОБ=1+2=3  ОБМ=1+3+2=6 | | | | |  | ОБ=2+2=4  ОБМ=1+2+1+2=6 | | | | |
|  | | | | |  |  | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | |  |  | | | | |
| {E} (3) | | | | |  | {F} (1) | | | | |
| R | b5 | b8 | b9 | c |  | R | b4 | b6 | b9 | c |
| D |  |  | 1 | 1 |  | C | 1 | 1 |  | 2 |
| F | 1 | 1 |  | 1 |  | D |  | 1 | 1 | 1 |
| G | 1 | 1 | 1 | 4 |  |  |  |  |  |  |
| ОБ=1+2=3  ОБМ=1+3+2=6  Разл. по ст. b9 {D} (1) и {G} (4) | | | | |  | ОБ=2+2=4  ОБМ=1+2+1+2=6  {A,F,C,D}-min решение | | | | |
|  | | | | |  | S=2+1+2+1=6 | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| {D} (1) | | |  | {A,E,G}  S=2+3+4=9 |
| R | b5 | b8 | c |
| F | 1 | 1 | 1 |
| G | 1 | 3 | 4 |
| ОБ=1+3=4  ОБМ=1+3+2+1=7  {A,E,D,F}  s=2+3+1+1=7 | | |  |
|  |

Ответ:

Минимальное решение {A,F,C,D}

Кратчайшее решение {E,G}