РГЗ 1, задание 7, вариант 6;

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Построить хотя бы одно минимальное покрытие:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |
|  | 1 |  |  | 1 | 1 |  |  |  |  | 2 |
|  | 1 |  |  | 1 |  | 1 | 1 |  | 1 | 3 |
|  |  |  |  |  | 1 |  | 1 |  | 1 | 1 |
|  |  | 1 |  |  |  | 1 | 1 |  |  | 2 |
|  |  | 1 | 1 |  | 1 |  |  | 1 |  | 3 |
|  | 1 |  | 1 | 1 | 1 |  |  |  |  | 2 |
|  | 1 |  |  |  |  | 1 |  | 1 |  | 2 |
|  |  |  | 1 | 1 |  |  |  |  | 1 | 1 |

Строка A является поглощаемой и ее можно вычеркнуть т.к. ее цена равна цене поглощающей строки:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |
|  | 1 |  |  | 1 | 1 |  |  |  |  | 2 |
|  | 1 |  |  | 1 |  | 1 | 1 |  | 1 | 3 |
|  |  |  |  |  | 1 |  | 1 |  | 1 | 1 |
|  |  | 1 |  |  |  | 1 | 1 |  |  | 2 |
|  |  | 1 | 1 |  | 1 |  |  | 1 |  | 3 |
|  | 1 |  | 1 | 1 | 1 |  |  |  |  | 2 |
|  | 1 |  |  |  |  | 1 |  | 1 |  | 2 |
|  |  |  | 1 | 1 |  |  |  |  | 1 | 1 |

Получим таблицу, которая является циклическим остатком:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |
|  | 1 |  |  | 1 |  | 1 | 1 |  | 1 | 3 |
|  |  |  |  |  | 1 |  | 1 |  | 1 | 1 |
|  |  | 1 |  |  |  | 1 | 1 |  |  | 2 |
|  |  | 1 | 1 |  | 1 |  |  | 1 |  | 3 |
|  | 1 |  | 1 | 1 | 1 |  |  |  |  | 2 |
|  | 1 |  |  |  |  | 1 |  | 1 |  | 2 |
|  |  |  | 1 | 1 |  |  |  |  | 1 | 1 |

Разложим ее по столбцу b2 т.к. он содержит минимальное количество единиц. Получим ветви решения R1 и R2:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R1 |  |  |  |  |  |  |  |  |  |  |
|  | 1 |  |  | 1 |  | 1 | 1 |  | 1 | 3 |
|  |  |  |  |  | 1 |  | 1 |  | 1 | 1 |
|  |  | 1 |  |  |  | 1 | 1 |  |  | 2 |
|  |  | 1 | 1 |  | 1 |  |  | 1 |  | 3 |
|  | 1 |  | 1 | 1 | 1 |  |  |  |  | 2 |
|  | 1 |  |  |  |  | 1 |  | 1 |  | 2 |
|  |  |  | 1 | 1 |  |  |  |  | 1 | 1 |

Получим таблицу, которая также является циклическим остатком.

{D}

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| R1 |  |  |  |  |  |  |  |
|  | 1 |  | 1 |  |  | 1 | 3 |
|  |  |  |  | 1 |  | 1 | 1 |
|  |  | 1 |  | 1 | 1 |  | 3 |
|  | 1 | 1 | 1 | 1 |  |  | 2 |
|  | 1 |  |  |  | 1 |  | 2 |
|  |  | 1 | 1 |  |  | 1 | 1 |

Разложим ее по столбцу b8 на ветви R11 и R12:

{D}

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| R11 |  |  |  |  |  |  |  |
|  | 1 |  | 1 |  |  | 1 | 3 |
|  |  |  |  | 1 |  | 1 | 1 |
|  |  | 1 |  | 1 | 1 |  | 3 |
|  | 1 | 1 | 1 | 1 |  |  | 2 |
|  | 1 |  |  |  | 1 |  | 2 |
|  |  | 1 | 1 |  |  | 1 | 1 |

Строки C и G являются поглощаемыми так как их цены равны ценам соответствующих поглощающих строк. Затем можно вычеркнуть столбец b4 как поглощающий:

{D, E}

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| R11 |  |  |  |  |
|  | 1 | 1 | 1 | 3 |
|  |  |  | 1 | 1 |
|  | 1 | 1 |  | 2 |
|  | 1 |  |  | 2 |
|  |  | 1 | 1 | 1 |

Получим таблицу:

{D, E}

|  |  |  |  |
| --- | --- | --- | --- |
| R11 |  |  |  |
|  | 1 | 1 | 3 |
|  | 1 |  | 2 |
|  |  | 1 | 1 |

Разложим ее по первому столбцу на 2 решения:

**{D, E, B}** **S = 8**; **{D, E, F, H} S = 8.**

Перейдем к ветви R12:

{D}

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| R12 |  |  |  |  |  |  |  |
|  | 1 |  | 1 |  |  | 1 | 3 |
|  |  |  |  | 1 |  | 1 | 1 |
|  |  | 1 |  | 1 | 1 |  | 3 |
|  | 1 | 1 | 1 | 1 |  |  | 2 |
|  | 1 |  |  |  | 1 |  | 2 |
|  |  | 1 | 1 |  |  | 1 | 1 |

Строки E и B можно вычеркнуть, т.к. они является поглощаемыми и их цены больше цен соответствующих поглощаемых строк. Затем, можно вычеркнуть один из равных столбцов b3 и b4:

{D, G}

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| R12 |  |  |  |  |  |
|  |  | 1 |  | 1 | 3 |
|  |  |  | 1 | 1 | 1 |
|  | 1 |  | 1 |  | 3 |
|  | 1 | 1 | 1 |  | 2 |
|  | 1 | 1 |  | 1 | 1 |

Получим следующую таблицу:

{D, G}

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| R12 |  |  |  |  |
|  |  | 1 | 1 | 1 |
|  | 1 | 1 |  | 2 |
|  | 1 |  | 1 | 1 |

Разложим ее по первому столбцу, получая 3 решения:

**{D, G, F, C} S = 7; {D, G, F, H} S = 7; {D, G, H, C} S = 6;**

Перейдем к ветви R2:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R2 |  |  |  |  |  |  |  |  |  |  |
|  | 1 |  |  | 1 |  | 1 | 1 |  | 1 | 3 |
|  |  |  |  |  | 1 |  | 1 |  | 1 | 1 |
|  |  | 1 |  |  |  | 1 | 1 |  |  | 2 |
|  |  | 1 | 1 |  | 1 |  |  | 1 |  | 3 |
|  | 1 |  | 1 | 1 | 1 |  |  |  |  | 2 |
|  | 1 |  |  |  |  | 1 |  | 1 |  | 2 |
|  |  |  | 1 | 1 |  |  |  |  | 1 | 1 |

Получим таблицу, являющуюся циклическим остатком:

{E}

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| R2 |  |  |  |  |  |  |
|  | 1 | 1 | 1 | 1 | 1 | 3 |
|  |  |  |  | 1 | 1 | 1 |
|  |  |  | 1 | 1 |  | 2 |
|  | 1 | 1 |  |  |  | 2 |
|  | 1 |  | 1 |  |  | 2 |
|  |  | 1 |  |  | 1 | 1 |

Разложим ее по столбцу b1 на ветви R21, R22, R23:

По ветви R21 получим решение **{E, B} S = 6;**

Ветвь R22:

{E}

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| R22 |  |  |  |  |  |  |
|  | 1 | 1 | 1 | 1 | 1 | 3 |
|  |  |  |  | 1 | 1 | 1 |
|  |  |  | 1 | 1 |  | 2 |
|  | 1 | 1 |  |  |  | 2 |
|  | 1 |  | 1 |  |  | 2 |
|  |  | 1 |  |  | 1 | 1 |

Строки G и H можно вычеркнуть, так как их цены соответственно равны ценам их поглощающих строк. Столбец b7 можно вычеркнуть как поглощающий:

{E, F}

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| R22 |  |  |  |  |
|  | 1 | 1 | 1 | 3 |
|  |  | 1 | 1 | 1 |
|  | 1 | 1 |  | 2 |
|  | 1 |  |  | 2 |
|  |  |  | 1 | 1 |

Получим таблицу вида:

{E, F}

|  |  |  |  |
| --- | --- | --- | --- |
| R22 |  |  |  |
|  | 1 | 1 | 3 |
|  |  | 1 | 1 |
|  | 1 |  | 2 |

Разложим ее на два решения:

**{E, F, B} S = 8; {E, F, D, C} S = 8;**

Рассмотрим ветвь R23:

{E}

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| R23 |  |  |  |  |  |  |
|  | 1 | 1 | 1 | 1 | 1 | 3 |
|  |  |  |  | 1 | 1 | 1 |
|  |  |  | 1 | 1 |  | 2 |
|  | 1 | 1 |  |  |  | 2 |
|  | 1 |  | 1 |  |  | 2 |
|  |  | 1 |  |  | 1 | 1 |

Строки F и D можно вычеркнуть, так как их цены больше цен соответствующих поглощающих строк:

{E, G}

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| R23 |  |  |  |  |
|  | 1 | 1 | 1 | 3 |
|  |  | 1 | 1 | 1 |
|  |  | 1 |  | 2 |
|  | 1 |  |  | 2 |
|  | 1 |  | 1 | 1 |

Получим таблицу вида:

{E, G}

|  |  |  |  |
| --- | --- | --- | --- |
| R23 |  |  |  |
|  | 1 | 1 | 3 |
|  |  | 1 | 1 |
|  | 1 |  | 1 |

Разложим ее на 2 решения:

**{E, G, B} S = 8; {E, G, H, C} S = 7;**

**Ответ:** минимальными являются покрытия **{D, G, H, C} S = 6, {E, B} S = 6.**