# Расчетная работа по дисциплине «Математические методы сетевого моделирования»

### Задача 2. Задача о соединении

Необходимо разработать оптимальную по стоимости схему газификации района, состоящего из 7 поселков. Стоимость прокладки газопровода между каждой парой поселков задана в таблице.

Показать схему газификации в виде графа и рассчитать ее общую стоимость.

**Контрольные вопросы**

1. Что такое цикл?
2. Что такое остов графа?
3. Сколько ребер содержит остов?
4. Сколько остовов может иметь граф?
5. Какой граф совпадает со своим остовом?
6. Для чего нужен алгоритм Краскала?
7. В чем заключается алгоритм Краскала?
8. Какой есть альтернативный способ решения задачи?
9. Если в графе 12 вершин и 25 ребер, каким способом удобнее найти остов?

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| Поселок | A | B | C | D | E | F | G |
| A |  | 70 | 83 | 65 | 12 | - | 140 |
| B |  |  | - | 91 | 80 | 20 | - |
| C |  |  |  | 112 | - | 45 | 170 |
| D |  |  |  |  | 35 | 25 | - |
| E |  |  |  |  |  | 52 | - |
| F |  |  |  |  |  |  | 110 |
| G |  |  |  |  |  |  |  |

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| Поселок | A | B | C | D | E | F | G |
| A |  | 10 | - | 61 | 85 | 71 | 20 |
| B |  |  | 43 | 70 | 35 | 22 | 60 |
| C |  |  |  | - | 64 | 88 | 32 |
| D |  |  |  |  | 75 | 36 | - |
| E |  |  |  |  |  | 61 | 90 |
| F |  |  |  |  |  |  | 54 |
| G |  |  |  |  |  |  |  |

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| Поселок | A | B | C | D | E | F | G |
| A |  | 190 | 125 | 81 | 210 | - | 145 |
| B |  |  | 163 | 174 | 90 | 180 | - |
| C |  |  |  | 130 | 90 | 140 | 184 |
| D |  |  |  |  | - | 100 | 160 |
| E |  |  |  |  |  | - | 187 |
| F |  |  |  |  |  |  | 170 |
| G |  |  |  |  |  |  |  |

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| Поселок | A | B | C | D | E | F | G |
| A |  | 5 | 15 | - | 34 | 7 | 4 |
| B |  |  | 3 | 17 | 6 | 23 | 8 |
| C |  |  |  | 8 | 20 | - | 9 |
| D |  |  |  |  | 16 | 18 | 9 |
| E |  |  |  |  |  | 30 | - |
| F |  |  |  |  |  |  | 19 |
| G |  |  |  |  |  |  |  |

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| Поселок | A | B | C | D | E | F | G |
| A |  | - | 65 | 38 | 23 | - | - |
| B |  |  | 76 | - | 50 | 80 | - |
| C |  |  |  | 23 | 89 | 100 | 110 |
| D |  |  |  |  | - | 93 | 74 |
| E |  |  |  |  |  | - | 35 |
| F |  |  |  |  |  |  | 40 |
| G |  |  |  |  |  |  |  |

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| Поселок | A | B | C | D | E | F | G |
| A |  | 224 | 278 | - | - | 193 | 250 |
| B |  |  | 283 | 240 | 217 | 274 | - |
| C |  |  |  | 285 | 214 | 186 | - |
| D |  |  |  |  | 276 | 218 | 245 |
| E |  |  |  |  |  | - | 265 |
| F |  |  |  |  |  |  | 239 |
| G |  |  |  |  |  |  |  |

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| Поселок | A | B | C | D | E | F | G |
| A |  | 56 | 61 | - | - | - | 90 |
| B |  |  | - | 73 | 18 | 65 | 67 |
| C |  |  |  | 43 | - | 82 | 34 |
| D |  |  |  |  | 38 | 45 | - |
| E |  |  |  |  |  | 70 | 63 |
| F |  |  |  |  |  |  | - |
| G |  |  |  |  |  |  |  |

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| Поселок | A | B | C | D | E | F | G |
| A |  | 9 | 11 | - | 15 | 12 | 20 |
| B |  |  | 9 | 6 | 8 | 14 | 5 |
| C |  |  |  | 13 | - | 15 | 15 |
| D |  |  |  |  | 21 | - | 19 |
| E |  |  |  |  |  | 20 | 32 |
| F |  |  |  |  |  |  | - |
| G |  |  |  |  |  |  |  |

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| Поселок | A | B | C | D | E | F | G |
| A |  | 28 | 27 | 47 | 32 | 57 | 90 |
| B |  |  | 38 | 20 | 54 | 42 | 60 |
| C |  |  |  | 32 | 18 | 64 | 35 |
| D |  |  |  |  | 28 | 35 | 53 |
| E |  |  |  |  |  | 27 | 61 |
| F |  |  |  |  |  |  | - |
| G |  |  |  |  |  |  |  |

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| Поселок | A | B | C | D | E | F | G |
| A |  | 51 | 42 | 15 | 19 | - | 27 |
| B |  |  | - | 14 | - | 40 | 90 |
| C |  |  |  | 61 | 56 | - | - |
| D |  |  |  |  | - | 37 | 44 |
| E |  |  |  |  |  | 36 | - |
| F |  |  |  |  |  |  | 61 |
| G |  |  |  |  |  |  |  |