

## РЕШИТЕ ЗАДАЧИ:

1. Найдите минимальный остов дерева представленного на рис. 2.33 графа.

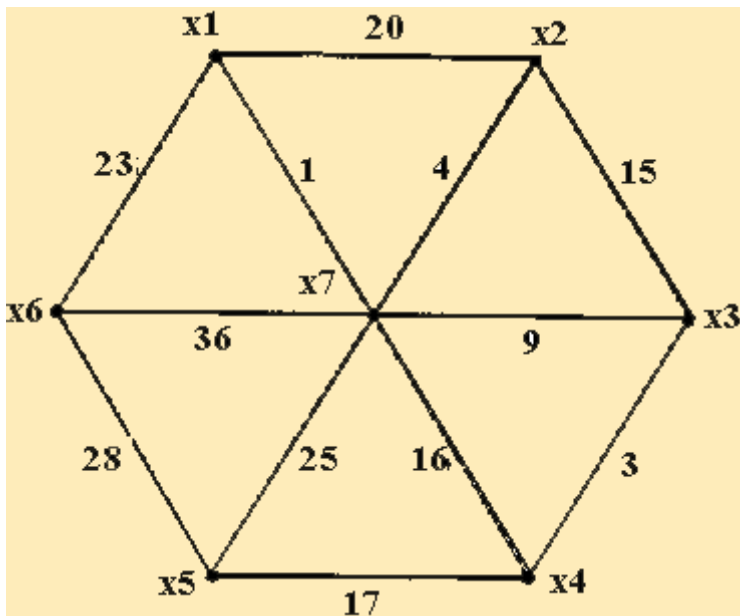


Рис. 2.33

|    | X1  | X2  | X3  | X4  | X5  | X6  | X7 |
|----|-----|-----|-----|-----|-----|-----|----|
| X1 | 0   | 20  | 0   | 017 | 0   | 23  | 1  |
| X2 | 20  | 0   | 15  | 0   | 029 | 0   | 4  |
| X3 | 0   | 15  | 0   | 3   | 0   | 045 | 9  |
| X4 | 017 | 029 | 3   | 0   | 17  | 0   | 16 |
| X5 | 0   | 0   | 0   | 17  | 0   | 28  | 25 |
| X6 | 23  | 0   | 045 | 0   | 28  | 0   | 36 |
| X7 | 1   | 4   | 9   | 16  | 25  | 36  | 0  |

|    | X1            | X2            | X3 | X4            | X5 | X6 | X7 |
|----|---------------|---------------|----|---------------|----|----|----|
| X1 |               |               |    |               |    |    |    |
| X2 | <del>20</del> |               |    |               |    |    |    |
| X3 | 0             | <del>15</del> |    |               |    |    |    |
| X4 | 0             | 0             | 3  |               |    |    |    |
| X5 | 0             | 0             | 0  | 17            |    |    |    |
| X6 | 23            | 0             | 0  | 0             | 28 |    |    |
| X7 | 1             | 4             | 9  | <del>16</del> | 25 | 36 |    |

Минимальный остов:  $1+23+4+9+3+17+25+28=110$

2. Найдите кратчайший путь на представленном графе (рис. 2.34).

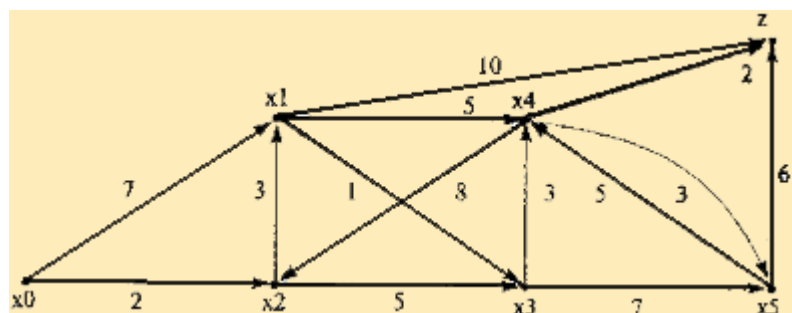


Рис. 2.34

|    | X0 | X1 | X2 | X3 | X4 | X5 | Z  |
|----|----|----|----|----|----|----|----|
| X0 |    | 7  | 2  |    |    |    |    |
| X1 |    |    |    | 1  | 5  |    | 10 |
| X2 |    | 3  |    | 5  |    |    |    |
| X3 |    |    |    |    | 3  | 7  |    |
| X4 |    |    | 8  |    |    | 3  | 2  |
| X5 |    |    |    |    | 5  |    | 6  |

$\Gamma\{X_0\}=\{X_1, X_2\}$   
 $I(X_1)=\min[\inf, 0^*+7]=7$   
 $I(X_2)=\min[\inf, 0^*+2]=2$   
 $\min[I(X_1), I(X_2)]=2$   
 $X_2:I(X_2)=2^*, p=2$

$\Gamma\{X_2\}=\{X_1, X_3\}$   
 $I(X_1)=\min[7, 2^*+3]=5$   
 $I(X_3)=\min[\inf, 2^*+5]=7$   
 $\min[I(X_1), I(X_3)]=5$   
 $X_1:I(X_1)=5^*, p=5$

$\Gamma\{X_1\}=\{X_3, X_4, Z\}$   
 $I(X_3)=\min[7, 5^*+1]=6$   
 $I(X_4)=\min[\inf, 5^*+5]=10$   
 $I(Z)=\min[\inf, 5^*+10]=15$   
 $\min[I(X_3), I(X_4), I(Z)]=6$   
 $X_3:I(X_3)=6, p=6$

$\Gamma\{X_3\}=\{X_4, X_5\}$   
 $I(X_4)=\min[10, 6^*+3]=9$   
 $I(X_5)=\min[\inf, 6^*+7]=13$   
 $\min[I(X_4), I(X_5)]=9$   
 $X_4:I(X_4)=9, p=9$

$\Gamma\{X_4\}=\{X_5, Z\}$   
 $I(X_5)=\min[13, 9^*+3]=12$   
 $I(Z)=\min[15, 9^*+2]=11$   
 $\min[I(X_5), I(Z)]=11$   
 $Z:I(Z)=11, p=11$

Оптимальный путь:  
 $X_0 \Rightarrow X_2 \Rightarrow X_1 \Rightarrow X_3 \Rightarrow X_4 \Rightarrow Z = 11$