

Appendix C

Orthogonal Arrays and Linear Graphs for Chapter 38

$L_4(2^3)$

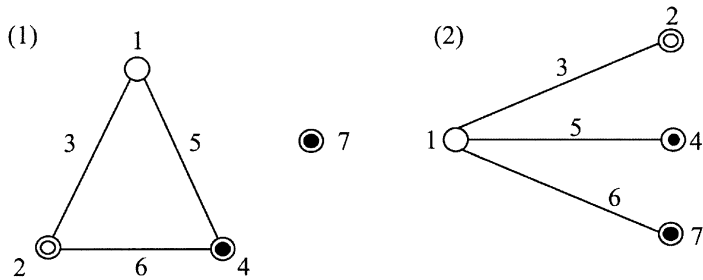
| No. | 1 | 2 | 3 |
|-----|----------|----------|----------|
| 1 | 1 | 1 | 1 |
| 2 | 1 | 2 | 2 |
| 3 | 2 | 1 | 2 |
| 4 | 2 | 2 | 1 |
| | <i>a</i> | <i>b</i> | <i>a</i> |
| | | | <i>b</i> |
| | ⏟ 1 | ⏟ 2 | |

$L_8(2^7)$

| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-----|----------|----------|----------|----------|----------|----------|----------|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| 3 | 1 | 2 | 2 | 1 | 1 | 2 | 2 |
| 4 | 1 | 2 | 2 | 2 | 2 | 1 | 1 |
| 5 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| 6 | 2 | 1 | 2 | 2 | 1 | 2 | 1 |
| 7 | 2 | 2 | 1 | 1 | 2 | 2 | 1 |
| 8 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| | <i>a</i> | <i>b</i> | <i>a</i> | <i>c</i> | <i>a</i> | <i>b</i> | <i>a</i> |
| | | | <i>b</i> | | <i>c</i> | <i>c</i> | <i>b</i> |
| | ⏟ 1 | ⏟ 2 | | ⏟ 3 | | | <i>c</i> |

Interaction between Two Columns

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-----|-----|-----|-----|-----|-----|-----|
| (1) | 3 | 2 | 5 | 4 | 7 | 6 |
| | (2) | 1 | 6 | 7 | 4 | 5 |
| | | (3) | 7 | 6 | 5 | 4 |
| | | | (4) | 1 | 2 | 3 |
| | | | | (5) | 3 | 2 |
| | | | | | (6) | 1 |
| | | | | | | (7) |

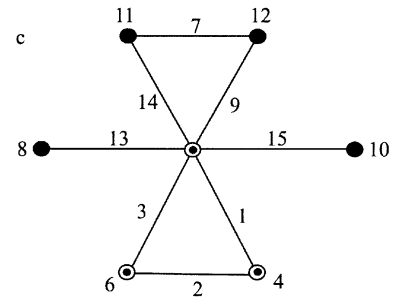
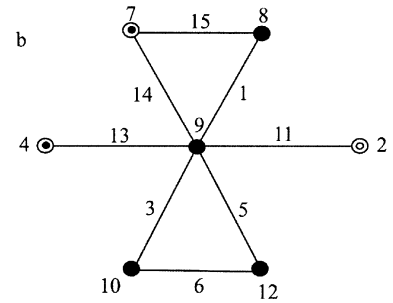
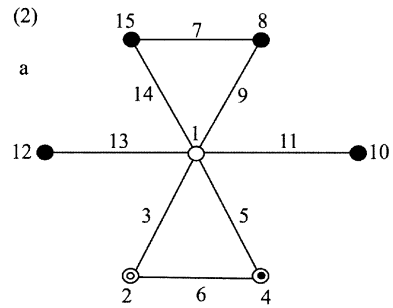
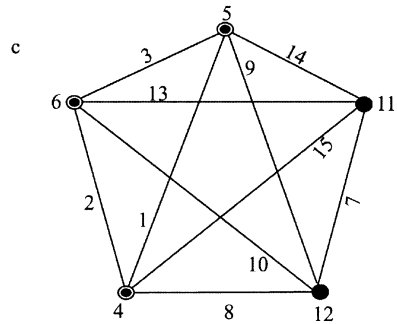
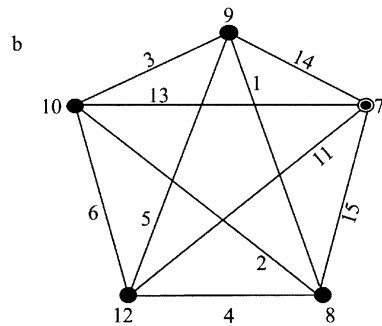
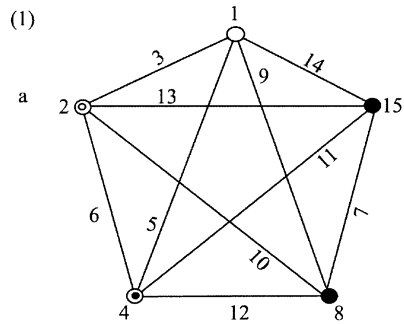


$L_{12}(2^{11})$

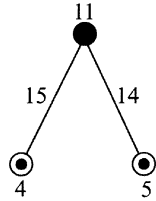
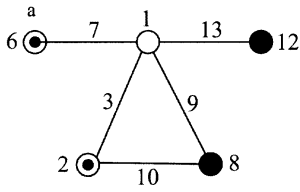
| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|-----|---|---|---|---|---|---|---|---|---|----|----|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 3 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 |
| 4 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 |
| 5 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 1 |
| 6 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 1 |
| 7 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 |
| 8 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 |
| 9 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 |
| 10 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 |
| 11 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 |
| 12 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 1 |
| | 1 | 2 | | | | | | | | | |

$L_{16}(2^{15})$

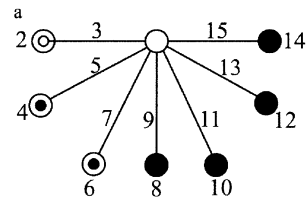
| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 3 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| 4 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| 5 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 |
| 6 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 |
| 7 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 |
| 8 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 |
| 9 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| 10 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 |
| 11 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 1 |
| 12 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 |
| 13 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 |
| 14 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| 15 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| 16 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 1 |
| | <i>a</i> | <i>b</i> | <i>a</i> | <i>c</i> | <i>a</i> | <i>b</i> | <i>a</i> | <i>d</i> | <i>a</i> | <i>b</i> | <i>a</i> | <i>c</i> | <i>a</i> | <i>b</i> | <i>a</i> |
| | | | <i>b</i> | | <i>c</i> | <i>c</i> | <i>b</i> | | <i>d</i> | <i>d</i> | <i>b</i> | <i>d</i> | <i>c</i> | <i>c</i> | <i>b</i> |
| | | | | | | | <i>c</i> | | | | <i>d</i> | | <i>d</i> | <i>d</i> | <i>c</i> |
| | | | | | | | | | | | | | | | <i>d</i> |
| | 1 | | 2 | | 3 | | | | 4 | | | | | | |
| Interaction between Two Columns | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
| (1) | 3 | 2 | 5 | 4 | 7 | 6 | 9 | 8 | 11 | 10 | 13 | 12 | 15 | 14 | |
| | (2) | 1 | 6 | 7 | 4 | 5 | 10 | 11 | 8 | 9 | 14 | 15 | 12 | 13 | |
| | | (3) | 7 | 6 | 5 | 4 | 11 | 10 | 9 | 8 | 15 | 14 | 13 | 12 | |
| | | | (4) | 1 | 2 | 3 | 12 | 13 | 14 | 15 | 8 | 9 | 10 | 11 | |
| | | | | (5) | 3 | 2 | 13 | 12 | 15 | 14 | 9 | 8 | 11 | 10 | |
| | | | | | (6) | 1 | 14 | 15 | 12 | 13 | 10 | 11 | 8 | 9 | |
| | | | | | | (7) | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | |
| | | | | | | | (8) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| | | | | | | | | (9) | 3 | 2 | 5 | 4 | 7 | 6 | |
| | | | | | | | | | (10) | 1 | 6 | 7 | 4 | 5 | |
| | | | | | | | | | | (11) | 7 | 6 | 5 | 4 | |
| | | | | | | | | | | | (12) | 1 | 2 | 3 | |
| | | | | | | | | | | | | (13) | 3 | 2 | |
| | | | | | | | | | | | | | (14) | 1 | |



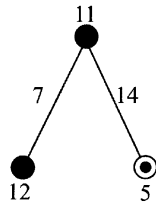
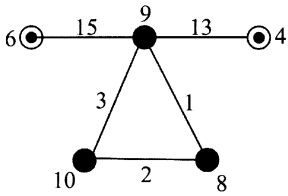
(3)



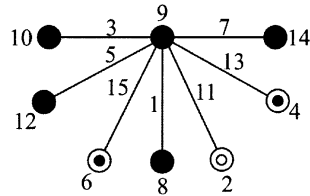
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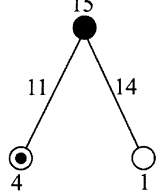
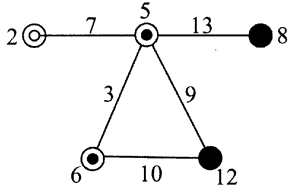
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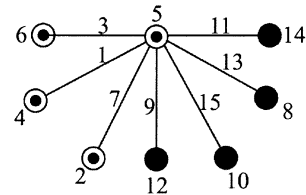
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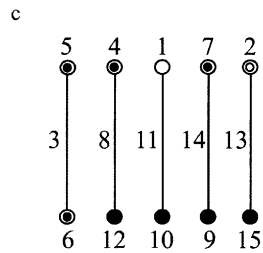
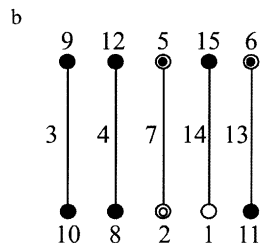
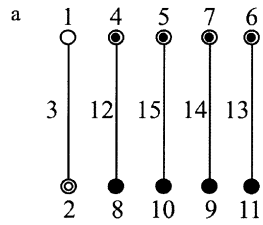
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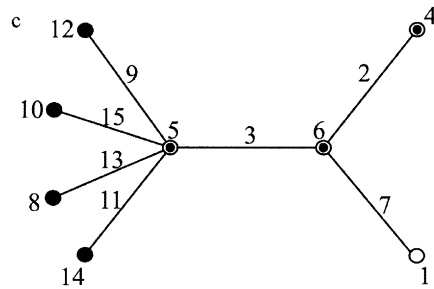
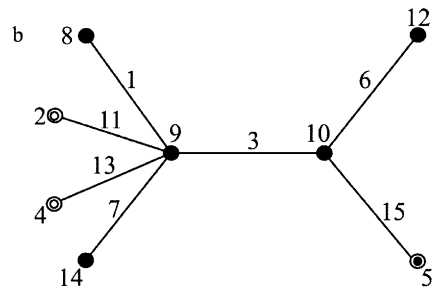
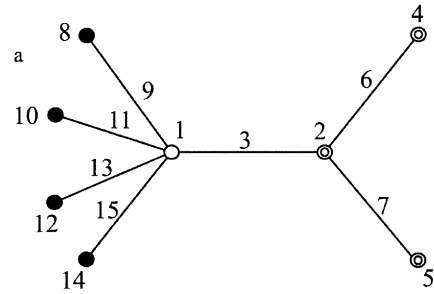
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(5)

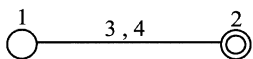


(6)



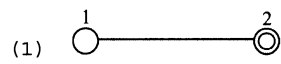
$L_9(3^4)$

| No. | 1 | 2 | 3 | 4 |
|-----|----------|----------|----------|-----------------------|
| 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 2 | 2 | 2 |
| 4 | 2 | 1 | 2 | 3 |
| 5 | 2 | 2 | 3 | 1 |
| 6 | 2 | 3 | 1 | 2 |
| 7 | 3 | 1 | 3 | 2 |
| 8 | 3 | 2 | 1 | 3 |
| 9 | 3 | 3 | 2 | 1 |
| | <i>a</i> | <i>b</i> | <i>a</i> | <i>a</i> |
| | | | <i>b</i> | <i>b</i> ² |
| | ⏟ | ⏟ | | |
| | 1 | 2 | | |



$L_{18}(2^1 \times 3^7)$

| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
|-----|--------|--------|--------|---|---|---|---|---|--|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | |
| 3 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | |
| 4 | 1 | 2 | 1 | 1 | 2 | 2 | 3 | 3 | |
| 5 | 1 | 2 | 2 | 2 | 3 | 3 | 1 | 1 | |
| 6 | 1 | 2 | 3 | 3 | 1 | 1 | 2 | 2 | |
| 7 | 1 | 3 | 1 | 2 | 1 | 3 | 2 | 3 | |
| 8 | 1 | 3 | 2 | 3 | 2 | 1 | 3 | 1 | |
| 9 | 1 | 3 | 3 | 1 | 3 | 2 | 1 | 2 | |
| 10 | 2 | 1 | 1 | 3 | 3 | 2 | 2 | 1 | |
| 11 | 2 | 1 | 2 | 1 | 1 | 3 | 3 | 2 | |
| 12 | 2 | 1 | 3 | 2 | 2 | 1 | 1 | 3 | |
| 13 | 2 | 2 | 1 | 2 | 3 | 1 | 3 | 2 | |
| 14 | 2 | 2 | 2 | 3 | 1 | 2 | 1 | 3 | |
| 15 | 2 | 2 | 3 | 1 | 2 | 3 | 2 | 1 | |
| 16 | 2 | 3 | 1 | 3 | 2 | 3 | 1 | 2 | |
| 17 | 2 | 3 | 2 | 1 | 3 | 1 | 2 | 3 | |
| 18 | 2 | 3 | 3 | 2 | 1 | 2 | 3 | 1 | |
| | ⏟ 1 | ⏟ 2 | ⏟ 3 | | | | | | |



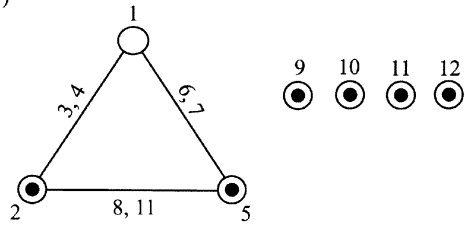
$L_{27}(3^{13})$

| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|-----|----------|----------|----------|-----------------------|----------|----------|-----------------------|----------|----------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 3 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 4 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 |
| 5 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 1 | 1 | 1 |
| 6 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 1 | 1 | 1 | 2 | 2 | 2 |
| 7 | 1 | 3 | 3 | 3 | 1 | 1 | 1 | 3 | 3 | 3 | 2 | 2 | 2 |
| 8 | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | 3 | 3 |
| 9 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 1 |
| 10 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| 11 | 2 | 1 | 2 | 3 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 |
| 12 | 2 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 |
| 13 | 2 | 2 | 3 | 1 | 1 | 2 | 3 | 2 | 3 | 1 | 3 | 1 | 2 |
| 14 | 2 | 2 | 3 | 1 | 2 | 3 | 1 | 3 | 1 | 2 | 1 | 2 | 3 |
| 15 | 2 | 2 | 3 | 1 | 3 | 1 | 2 | 1 | 2 | 3 | 2 | 3 | 1 |
| 16 | 2 | 3 | 1 | 2 | 1 | 2 | 3 | 3 | 1 | 2 | 2 | 3 | 1 |
| 17 | 2 | 3 | 1 | 2 | 2 | 3 | 1 | 1 | 2 | 3 | 3 | 1 | 2 |
| 18 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 | 1 | 1 | 2 | 3 |
| 19 | 3 | 1 | 3 | 2 | 1 | 3 | 2 | 1 | 3 | 2 | 1 | 3 | 2 |
| 20 | 3 | 1 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 3 | 2 | 1 | 3 |
| 21 | 3 | 1 | 3 | 2 | 3 | 2 | 1 | 3 | 2 | 1 | 3 | 2 | 1 |
| 22 | 3 | 2 | 1 | 3 | 1 | 3 | 2 | 2 | 1 | 3 | 3 | 2 | 1 |
| 23 | 3 | 2 | 1 | 3 | 2 | 1 | 3 | 3 | 2 | 1 | 1 | 3 | 2 |
| 24 | 3 | 2 | 1 | 3 | 3 | 2 | 1 | 1 | 3 | 2 | 2 | 1 | 3 |
| 25 | 3 | 3 | 2 | 1 | 1 | 3 | 2 | 3 | 2 | 1 | 2 | 1 | 3 |
| 26 | 3 | 3 | 2 | 1 | 2 | 1 | 3 | 1 | 3 | 2 | 3 | 2 | 1 |
| 27 | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 2 | 1 | 3 | 1 | 3 | 2 |
| | <i>a</i> | <i>b</i> | <i>a</i> | <i>a</i> | <i>c</i> | <i>a</i> | <i>a</i> | <i>b</i> | <i>a</i> | <i>a</i> | <i>b</i> | <i>a</i> | <i>a</i> |
| | | | <i>b</i> | <i>b</i> ² | | <i>c</i> | <i>c</i> ² | <i>c</i> | <i>b</i> | <i>b</i> ² | <i>c</i> ² | <i>b</i> ² | <i>b</i> |
| | | | | | | | | | <i>c</i> | <i>c</i> ² | | <i>c</i> | <i>c</i> ² |
| | } | } | | } | | | | | | | | | |
| | 1 | 2 | | 3 | | | | | | | | | |

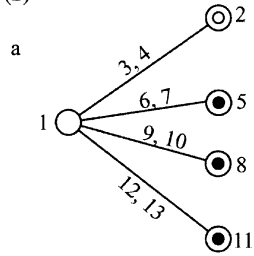
$L_{27}(3^{13})$ (Continued)

| Interaction between Two Columns | | | | | | | | | | | | |
|---------------------------------|--------|--------|--------|----------|----------|----------|---------|---------|---------|----------|----------|----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| (1) | 3 4 | 2 4 | 2 3 | 6 7 | 5 7 | 5 6 | 9 10 | 8 10 | 8 9 | 12 13 | 11 13 | 11 12 |
| | (2) | 1 4 | 1 3 | 8 11 | 9 12 | 10 13 | 5 11 | 6 12 | 7 13 | 5 8 | 6 9 | 7 10 |
| | | (3) | 1 2 | 9 13 | 10 11 | 8 12 | 7 12 | 5 13 | 6 11 | 6 10 | 7 8 | 5 9 |
| | | | (4) | 10 12 | 8 13 | 9 11 | 6 13 | 7 11 | 5 12 | 7 9 | 5 10 | 6 8 |
| | | | | (5) | 1 7 | 1 6 | 2 11 | 3 13 | 4 12 | 2 8 | 4 10 | 3 9 |
| | | | | | (6) | 1 5 | 4 13 | 2 12 | 3 11 | 3 10 | 2 9 | 4 8 |
| | | | | | | (7) | 3 12 | 4 11 | 2 13 | 4 9 | 3 8 | 2 10 |
| | | | | | | | (8) | 1 10 | 1 9 | 2 5 | 3 7 | 4 6 |
| | | | | | | | | (9) | 1 8 | 4 7 | 2 6 | 3 5 |
| | | | | | | | | | (10) | 3 6 | 4 5 | 2 7 |
| | | | | | | | | | | (11) | 1 13 | 1 12 |
| | | | | | | | | | | | (12) | 1 11 |

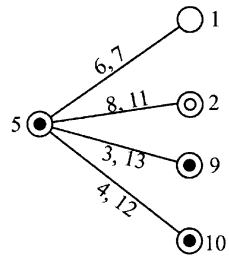
(1)



(2)



b



$L_{36}(2^{11} \times 3^{12})^a$

| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 1' | 2' | 3' | 4' | |
|-----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 |
| 4 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | 1 | |
| 5 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | |
| 6 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | |
| 7 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 3 | 3 | 1 | 2 | 2 | 3 | 2 | 1 | 2 | 1 | |
| 8 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 1 | 2 | 3 | 1 | 1 | 2 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | |
| 9 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 2 | 3 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | |
| 10 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 3 | 2 | 1 | 3 | 2 | 3 | 2 | 1 | 3 | 2 | 2 | 2 | 1 | 1 | |
| 11 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 3 | 2 | 1 | 3 | 1 | 3 | 2 | 1 | 3 | 2 | 2 | 1 | 1 | |
| 12 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 2 | 1 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | |
| 13 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 3 | 1 | 3 | 2 | 1 | 3 | 3 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | |
| 14 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 1 | 3 | 2 | 1 | 1 | 3 | 2 | 3 | 1 | 1 | 1 | 2 | |
| 15 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 3 | 1 | 2 | 3 | 2 | 1 | 3 | 2 | 2 | 1 | 3 | 1 | 1 | 1 | 1 | 2 | |
| 16 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 3 | 2 | 1 | 1 | 3 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 2 | 2 | |
| 17 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 3 | 1 | 3 | 2 | 2 | 1 | 3 | 1 | 1 | 3 | 2 | 1 | 2 | 2 | 2 | |
| 18 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 3 | 1 | 2 | 1 | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 3 | 1 | 2 | 2 | 2 | |
| 19 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 3 | 3 | 3 | 1 | 2 | 2 | 1 | 2 | 3 | 2 | 1 | 2 | 2 | |
| 20 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 3 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 2 | 3 | 1 | 2 | 1 | 2 | 2 | |
| 21 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 3 | 1 | 3 | 2 | 2 | 2 | 3 | 1 | 1 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | |
| 22 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 3 | 3 | 1 | 2 | 1 | 1 | 3 | 3 | 2 | 2 | 2 | 1 | 2 | |
| 23 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 1 | 1 | 2 | 3 | 2 | 2 | 1 | 1 | 3 | 2 | 2 | 1 | 2 | |
| 24 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 2 | 2 | 3 | 1 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | |
| 25 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 3 | 2 | 1 | 2 | 3 | 3 | 1 | 3 | 1 | 2 | 2 | 1 | 1 | 1 | 3 | |
| 26 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 3 | 2 | 3 | 1 | 1 | 2 | 1 | 2 | 3 | 3 | 1 | 1 | 1 | 3 | |
| 27 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 3 | 2 | 1 | 3 | 1 | 2 | 2 | 3 | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 3 | |
| 28 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 3 | 2 | 2 | 2 | 1 | 1 | 3 | 2 | 3 | 1 | 3 | 1 | 2 | 2 | 3 | |
| 29 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 3 | 3 | 3 | 2 | 2 | 1 | 3 | 1 | 2 | 1 | 1 | 2 | 2 | 3 | |
| 30 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 3 | 2 | 1 | 1 | 1 | 3 | 3 | 2 | 1 | 2 | 3 | 2 | 1 | 2 | 2 | 3 | |
| 31 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 3 | |
| 32 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | 1 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 3 | |

$L_{36}(2^{11} \times 3^{12})^a$ (Continued)

| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 1' | 2' | 3' | 4' |
|-----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 33 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 3 | 1 | 3 | 3 | 2 | 1 | 2 | 3 |
| 34 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 3 | 1 | 2 | 3 | 2 | 3 | 1 | 2 | 2 | 3 | 1 | 2 | 2 | 1 | 3 |
| 35 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 3 | 1 | 3 | 1 | 2 | 3 | 3 | 1 | 2 | 2 | 2 | 1 | 3 |
| 36 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 3 | 2 | 3 | 1 | 2 | 1 | 2 | 3 | 1 | 1 | 2 | 3 | 2 | 2 | 1 | 3 |
| | 1 | 2 | | | | | | | | | | 3 | | | | | | | | | | | | | | | |

^aBy introducing columns 1', 2', 3', and 4' in place of columns 1, 2, ..., 11, one obtains $L_{36}(2^3 \times 3^{13})$.

$L_{54}(2^1 \times 3^{25})$

| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|-----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 4 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 |
| 5 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 3 |
| 6 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 |
| 7 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 |
| 8 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 |
| 9 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| 10 | 1 | 2 | 1 | 1 | 2 | 2 | 3 | 3 | 1 | 1 | 2 | 2 | 3 | 3 | 1 | 1 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 |
| 11 | 1 | 2 | 1 | 1 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 1 | 3 | 1 | 1 | 3 | 1 | 3 |
| 12 | 1 | 2 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 1 |
| 13 | 1 | 2 | 2 | 2 | 3 | 3 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 1 | 1 | 1 | 1 |
| 14 | 1 | 2 | 2 | 2 | 3 | 3 | 1 | 1 | 2 | 2 | 3 | 3 | 1 | 1 | 3 | 1 | 3 | 1 | 1 | 3 | 1 | 3 | 2 | 2 | 2 | 2 |
| 15 | 1 | 2 | 2 | 2 | 3 | 3 | 1 | 1 | 3 | 3 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 3 | 3 | 3 | 3 |
| 16 | 1 | 2 | 3 | 3 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 2 | 3 | 2 | 3 |
| 17 | 1 | 2 | 3 | 3 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 1 | 1 | 1 | 3 | 1 | 3 | 2 | 2 | 2 | 2 | 3 | 1 | 3 | 1 |
| 18 | 1 | 2 | 3 | 3 | 1 | 1 | 2 | 2 | 3 | 3 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 2 |
| 19 | 1 | 3 | 1 | 2 | 1 | 3 | 2 | 3 | 1 | 2 | 1 | 3 | 2 | 3 | 1 | 1 | 2 | 3 | 1 | 1 | 3 | 2 | 2 | 3 | 3 | 2 |
| 20 | 1 | 3 | 1 | 2 | 1 | 3 | 2 | 3 | 2 | 3 | 2 | 1 | 3 | 1 | 2 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 3 | 1 | 1 | 3 |
| 21 | 1 | 3 | 1 | 2 | 1 | 3 | 2 | 3 | 3 | 1 | 3 | 2 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 2 | 1 |
| 22 | 1 | 3 | 2 | 3 | 2 | 1 | 3 | 1 | 1 | 2 | 1 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 1 | 1 | 3 | 2 | 1 | 1 |
| 23 | 1 | 3 | 2 | 3 | 2 | 1 | 3 | 1 | 2 | 3 | 2 | 1 | 3 | 1 | 3 | 1 | 1 | 3 | 3 | 1 | 2 | 2 | 1 | 3 | 2 | 2 |
| 24 | 1 | 3 | 2 | 3 | 2 | 1 | 3 | 1 | 3 | 1 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 3 | 3 | 2 | 1 | 3 | 3 |
| 25 | 1 | 3 | 3 | 1 | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 3 | 2 | 3 | 3 | 2 | 1 | 1 | 3 | 2 | 2 | 3 | 1 | 1 | 2 | 3 |
| 26 | 1 | 3 | 3 | 1 | 3 | 2 | 1 | 2 | 2 | 3 | 2 | 1 | 3 | 1 | 1 | 3 | 2 | 2 | 1 | 3 | 3 | 1 | 2 | 2 | 3 | 1 |
| 27 | 1 | 3 | 3 | 1 | 3 | 2 | 1 | 2 | 3 | 1 | 3 | 2 | 1 | 2 | 2 | 1 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 3 | 1 | 2 |
| 28 | 2 | 1 | 1 | 3 | 3 | 2 | 2 | 1 | 1 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 1 | 1 |
| 29 | 2 | 1 | 1 | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 3 | 3 | 2 | 2 | 2 | 1 | 3 | 1 | 3 | 3 | 1 | 3 | 1 | 2 | 2 |
| 30 | 2 | 1 | 1 | 3 | 3 | 2 | 2 | 1 | 3 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 3 | 3 |
| 31 | 2 | 1 | 2 | 1 | 1 | 3 | 3 | 2 | 1 | 3 | 3 | 2 | 2 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 3 | 2 | 3 | 2 | 2 | 3 |
| 32 | 2 | 1 | 2 | 1 | 1 | 3 | 3 | 2 | 2 | 1 | 1 | 3 | 3 | 2 | 3 | 1 | 2 | 2 | 2 | 2 | 1 | 3 | 1 | 3 | 3 | 1 |
| 33 | 2 | 1 | 2 | 1 | 1 | 3 | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 3 | 1 | 2 | 3 | 3 | 3 | 3 | 2 | 1 | 2 | 1 | 1 | 2 |

$L_{54}(2^1 \times 3^{25})$ (Continued)

| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|-----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 34 | 2 | 1 | 3 | 2 | 2 | 1 | 1 | 3 | 1 | 3 | 3 | 2 | 2 | 1 | 3 | 2 | 2 | 3 | 2 | 3 | 1 | 1 | 1 | 1 | 3 | 2 |
| 35 | 2 | 1 | 3 | 2 | 2 | 1 | 1 | 3 | 2 | 1 | 1 | 3 | 3 | 2 | 1 | 3 | 3 | 1 | 3 | 1 | 2 | 2 | 2 | 2 | 1 | 3 |
| 36 | 2 | 1 | 3 | 2 | 2 | 1 | 1 | 3 | 3 | 2 | 2 | 1 | 1 | 3 | 2 | 1 | 1 | 2 | 1 | 2 | 3 | 3 | 3 | 3 | 2 | 1 |
| 37 | 2 | 2 | 1 | 2 | 3 | 1 | 3 | 2 | 1 | 2 | 3 | 1 | 3 | 2 | 1 | 1 | 2 | 3 | 3 | 2 | 1 | 1 | 3 | 2 | 2 | 3 |
| 38 | 2 | 2 | 1 | 2 | 3 | 1 | 3 | 2 | 2 | 3 | 1 | 2 | 1 | 3 | 2 | 2 | 3 | 1 | 1 | 3 | 2 | 2 | 1 | 3 | 3 | 1 |
| 39 | 2 | 2 | 1 | 2 | 3 | 1 | 3 | 2 | 3 | 1 | 2 | 3 | 2 | 1 | 3 | 3 | 1 | 2 | 2 | 1 | 3 | 3 | 2 | 1 | 1 | 2 |
| 40 | 2 | 2 | 2 | 3 | 1 | 2 | 1 | 3 | 1 | 2 | 3 | 1 | 3 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 1 | 3 | 2 |
| 41 | 2 | 2 | 2 | 3 | 1 | 2 | 1 | 3 | 2 | 3 | 1 | 2 | 1 | 3 | 3 | 1 | 1 | 3 | 2 | 2 | 3 | 1 | 2 | 2 | 1 | 3 |
| 42 | 2 | 2 | 2 | 3 | 1 | 2 | 1 | 3 | 3 | 1 | 2 | 3 | 2 | 1 | 1 | 2 | 2 | 1 | 3 | 3 | 1 | 2 | 3 | 3 | 2 | 1 |
| 43 | 2 | 2 | 3 | 1 | 2 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 3 | 2 | 3 | 2 | 1 | 1 | 2 | 3 | 3 | 2 | 2 | 3 | 1 | 1 |
| 44 | 2 | 2 | 3 | 1 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 1 | 3 | 1 | 3 | 2 | 2 | 3 | 1 | 1 | 3 | 3 | 1 | 2 | 2 |
| 45 | 2 | 2 | 3 | 1 | 2 | 3 | 2 | 1 | 3 | 1 | 2 | 3 | 2 | 1 | 2 | 1 | 3 | 3 | 1 | 2 | 2 | 1 | 1 | 2 | 3 | 3 |
| 46 | 2 | 3 | 1 | 3 | 2 | 3 | 1 | 2 | 1 | 3 | 2 | 3 | 1 | 2 | 1 | 1 | 3 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 2 | 3 |
| 47 | 2 | 3 | 1 | 3 | 2 | 3 | 1 | 2 | 2 | 1 | 3 | 1 | 2 | 3 | 2 | 2 | 1 | 3 | 3 | 1 | 1 | 3 | 2 | 2 | 3 | 1 |
| 48 | 2 | 3 | 1 | 3 | 2 | 3 | 1 | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 3 | 3 | 2 | 1 | 1 | 2 | 2 | 1 | 3 | 3 | 1 | 2 |
| 49 | 2 | 3 | 2 | 1 | 3 | 1 | 2 | 3 | 1 | 3 | 2 | 3 | 1 | 2 | 2 | 3 | 1 | 1 | 3 | 2 | 1 | 1 | 2 | 3 | 3 | 2 |
| 50 | 2 | 3 | 2 | 1 | 3 | 1 | 2 | 3 | 2 | 1 | 3 | 1 | 2 | 3 | 3 | 1 | 2 | 2 | 1 | 3 | 2 | 2 | 3 | 1 | 1 | 3 |
| 51 | 2 | 3 | 2 | 1 | 3 | 1 | 2 | 3 | 3 | 2 | 1 | 2 | 3 | 1 | 1 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 1 | 2 | 2 | 1 |
| 52 | 2 | 3 | 3 | 2 | 1 | 2 | 3 | 1 | 1 | 3 | 2 | 3 | 1 | 2 | 3 | 2 | 2 | 3 | 1 | 1 | 2 | 3 | 3 | 2 | 1 | 1 |
| 53 | 2 | 3 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 1 | 3 | 1 | 2 | 3 | 1 | 3 | 3 | 1 | 2 | 2 | 3 | 1 | 1 | 3 | 2 | 2 |
| 54 | 2 | 3 | 3 | 2 | 1 | 2 | 3 | 1 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 1 | 1 | 2 | 3 | 3 | 1 | 2 | 2 | 1 | 3 | 3 |
| | 1 | 2 | 3 | | | 4 | | | | | | | | | | | | | | | | | | | | |