ДОМАШНЕЕ ЗАДАНИЕ № 1.

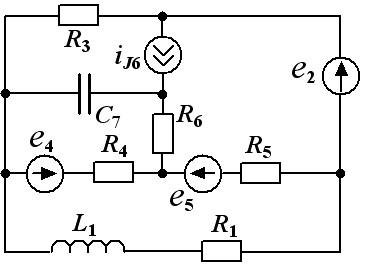
Методы анализа линейных разветвленных электрических цепей

ЗАДАЧА 1

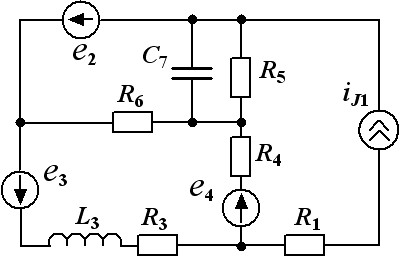
Рассчитать токи в заданной схеме методом контурных токов, методом узловых потенциалов и неизвестный ток в одной из ветвей методом эквивалентного источника.

Единицы измерения: *e* [В], *i* [А], *R* [Ом], *L* [мГн], *C* [мкФ].

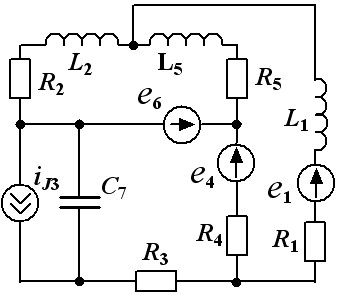
|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | *e*2 | *e*4 | *e*5 | *iJ*6 | *L*1 | *R*1 | *R*3 | *R*4 | *R*5 | *R*6 | *C*7 |
|  | 20 | 10 | 10 | 1 | 20 | 20 | 5 | 10 | 10 | 55 | 50 |



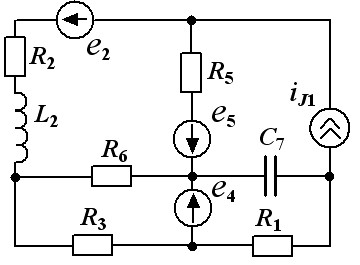
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | *iJ*1 | *e*2 | *e*3 | *e*4 | *R*1 | *R*3 | *L*3 | *R*4 | *R*5 | *R*6 | *C*7 |
|  | -5 | -10 | -10 | 5 | 10 | 20 | 20 | 10 | 20 | 20 | 50 |



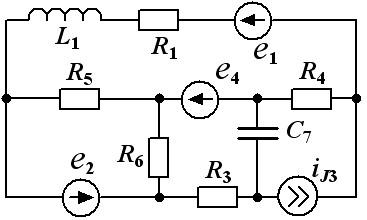
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3 | *e*1 | *iJ*3 | *e*4 | *e*6 | *R*1 | *L*1 | *L*2 | *R*2 | *R*3 | *R*4 | *L*5 | *R*5 | *C*7 |
|  | 40 | 2 | 40 | 20 | 40 | 9 | 40 | 20 | 10 | 20 | 10 | 10 | 50 |



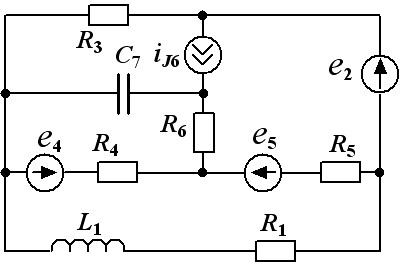
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4 | *iJ*1 | *e*2 | *e*4 | *e*5 | *R*1 | *R*2 | *L*2 | *R*3 | *R*5 | *R*6 | *C*7 |
|  | 0.5 | 20 | 30 | 30 | 20 | 50 | 20 | 20 | 10 | 10 | 50 |



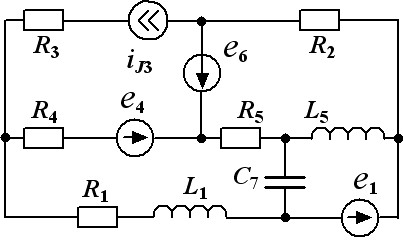
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | *e*1 | *e*2 | *iJ*3 | *e*4 | *R*1 | *L*1 | *R*3 | *R*4 | *R*5 | *R*6 | *C*7 |
|  | 20 | 30 | 2 | 10 | 30 | 70 | 25 | 25 | 30 | 10 | 50 |



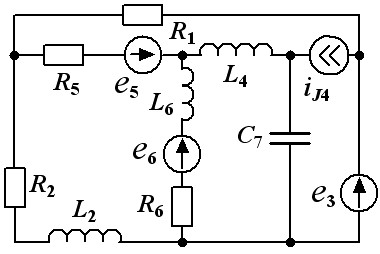
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | *e*2 | *e*4 | *e*5 | *iJ*6 | *R*1 | *L*1 | *R*3 | *R*4 | *R*5 | *R*6 | *C*7 |
|  | 30 | 45 | 30 | 2 | 10 | 10 | 10 | 15 | 5 | 25 | 20 |



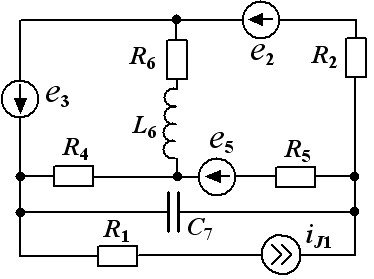
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 7 | *e*1 | *iJ*3 | *e*4 | *e*6 | *R*1 | *L*1 | *R*2 | *R*3 | *R*4 | *R*5 | *L*5 | *C*7 |
|  | 30 | 0.5 | 20 | 30 | 2 | 10 | 20 | 25 | 8 | 20 | 10 | 50 |



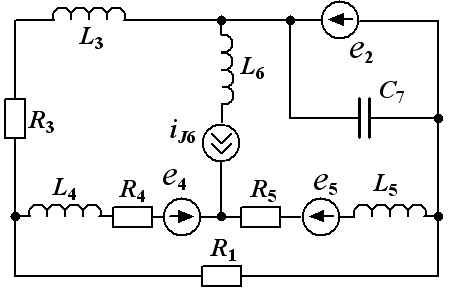
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | *e*3 | *iJ*4 | *e*5 | *e*6 | *R*1 | *R*2 | *L*2 | *L*4 | *R*5 | *R*6 | *L*6 | *C*7 |
|  | 20 | 0.4 | 40 | 20 | 20 | 20 | 10 | 20 | 20 | 40 | 20 | 50 |



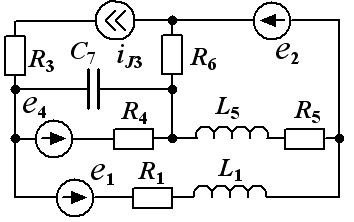
|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 9 | *iJ*1 | *e*2 | *e*3 | *e*5 | *R*1 | *R*2 | *R*4 | *R*5 | *L*6 | *R*6 | *C*7 |
|  | 1,4 | 40 | 20 | 40 | 10 | 20 | 10 | 20 | 40 | 40 | 50 |



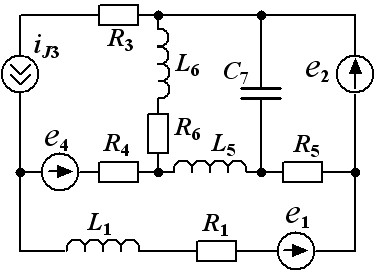
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | *e*2 | *e*4 | *e*5 | *iJ*6 | *R*1 | *L*3 | *R*3 | *L*4 | *R*4 | *R*5 | *L*5 | *L*6 | *C*7 |
|  | 30 | 30 | 40 | 1 | 20 | 30 | 20 | 20 | 20 | 40 | 20 | 10 | 50 |



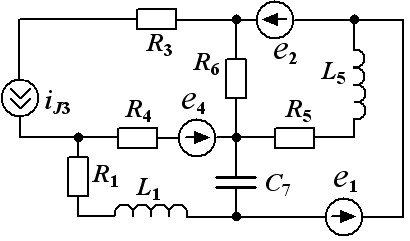
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11 | *e*1 | *e*2 | *iJ*3 | *e*4 | *R*1 | *L*1 | *R*3 | *R*4 | *L*5 | *R*5 | *R*6 | *C*7 |
|  | 30 | 40 | 1.2 | 10 | 45 | 75 | 20 | 30 | 60 | 50 | 25 | 50 |



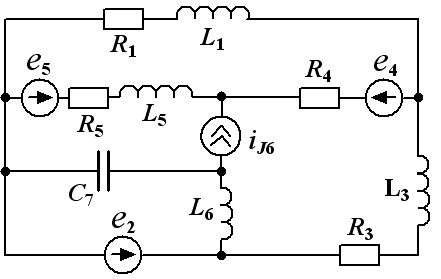
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | *e*1 | *e*2 | *iJ*3 | *e*4 | *R*1 | *L*1 | *R*3 | *R*4 | *R*5 | *L*5 | *R*6 | *L*6 | *C*7 |
|  | 80 | 40 | 1.5 | 30 | 20 | 10 | 30 | 15 | 10 | 10 | 10 | 10 | 50 |



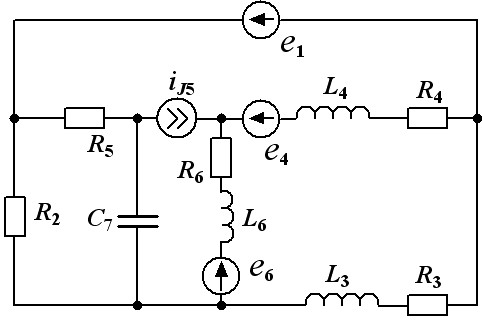
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 13 | *e*1 | *e*2 | *iJ*3 | *e*4 | *R*1 | *L*1 | *R*3 | *R*4 | *L*5 | *R*5 | *R*6 | *C*7 |
|  | 40 | 20 | 1.7 | 40 | 10 | 15 | 25 | 20 | 10 | 10 | 10 | 50 |



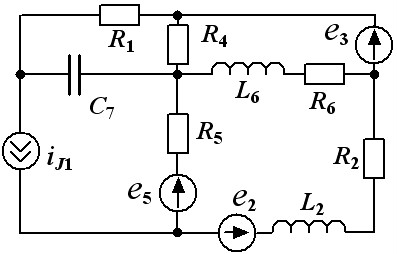
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 14 | *e*2 | *e*4 | *e*5 | *iJ*6 | *R*1 | *L*1 | *R*3 | *L*3 | *R*4 | *R*5 | *L*5 | *L*6 | *C*7 |
|  | 20 | 20 | 10 | 2 | 20 | 10 | 20 | 20 | 50 | 40 | 60 | 22 | 50 |



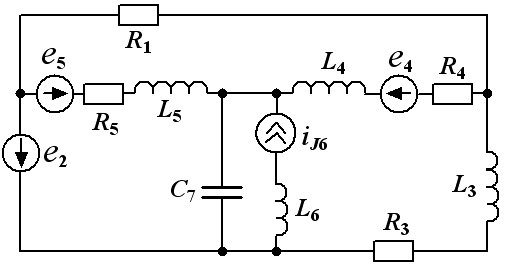
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 15 | *e*1 | *e*4 | *iJ*5 | *e*6 | *R*2 | *L*3 | *R*3 | *R*4 | *L*4 | *R*5 | *R*6 | *L*6 | *C*7 |
|  | 20 | 40 | 1.4 | 20 | 20 | 30 | 20 | 40 | 10 | 45 | 25 | 15 | 50 |



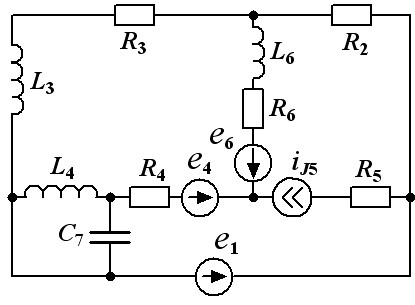
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 16 | *iJ*1 | *e*2 | *e*3 | *e*5 | *R*1 | *R*2 | *L*2 | *R*4 | *R*5 | *L*6 | *R*6 | *C*7 |
|  | 0.4 | 20 | 10 | 20 | 55 | 5 | 10 | 10 | 20 | 10 | 10 | 50 |



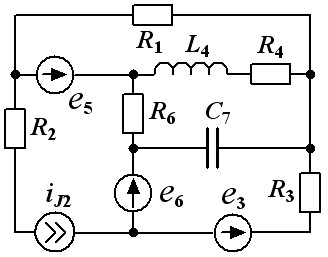
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 17 | *e*2 | *e*4 | *e*5 | *iJ*6 | *R*1 | *L*3 | *R*3 | *L*4 | *R*4 | *R*5 | *L*5 | *L*6 | *C*7 |
|  | 20 | 10 | 10 | 1.2 | 10 | 80 | 20 | 10 | 10 | 10 | 20 | 55 | 50 |



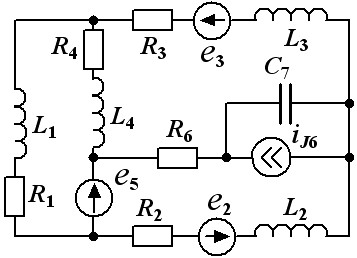
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 18 | *e*1 | *e*4 | *iJ*5 | *e*6 | *R*2 | *L*3 | *R*3 | *R*4 | *L*4 | *R*5 | *R*6 | *L*6 | *C*7 |
|  | 20 | 20 | 0.3 | 20 | 20 | 80 | 20 | 60 | 40 | 33 | 10 | 10 | 50 |



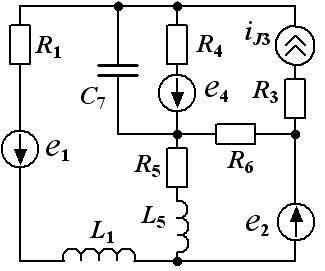
|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 19 | *iJ*2 | *e*3 | *e*5 | *e*6 | *R*1 | *R*2 | *R*3 | *L*4 | *R*4 | *R*6 | *C*7 |
|  | 0.1 | 10 | 20 | 20 | 40 | 33 | 10 | 40 | 20 | 10 | 50 |



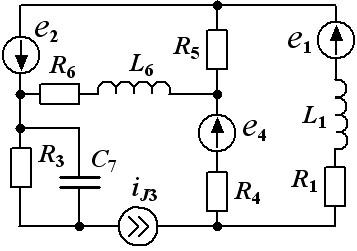
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 20 | *e*2 | *e*3 | *e*5 | *iJ*6 | *R*1 | *L*1 | *R*2 | *L*2 | *L*3 | *R*3 | *L*4 | *R*4 | *R*6 | *C*7 |
|  | 20 | 20 | 30 | 1.3 | 20 | 20 | 10 | 10 | 20 | 20 | 20 | 20 | 33 | 50 |



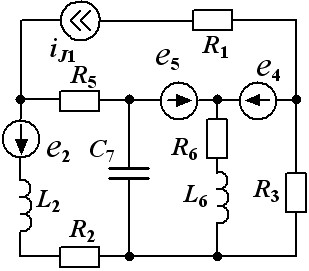
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 21 | *e*1 | *e*2 | *iJ*3 | *e*4 | *R*1 | *L*1 | *R*3 | *R*4 | *L*5 | *R*5 | *R*6 | *C*7 |
|  | 20 | 20 | 0.8 | 20 | 10 | 10 | 33 | 10 | 80 | 20 | 10 | 50 |



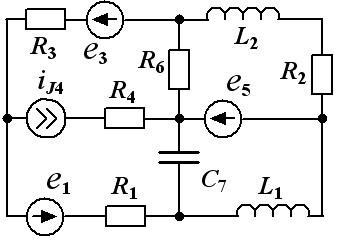
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 22 | *e*1 | *e*2 | *iJ*3 | *e*4 | *R*1 | *L*1 | *R*3 | *R*4 | *R*5 | *L*6 | *R*6 |
|  | 10 | 20 | 0.6 | 10 | 40 | 40 | 33 | 40 | 40 | 40 | 40 |



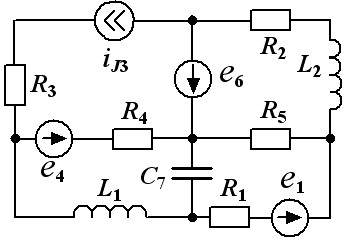
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 23 | *iJ*1 | *e*2 | *e*4 | *e*5 | *R*1 | *R*2 | *L*2 | *R*3 | *R*5 | *R*6 | *L*6 | *C*7 |
|  | 1 | 32 | 20 | 40 | 33 | 20 | 20 | 20 | 40 | 20 | 10 | 50 |



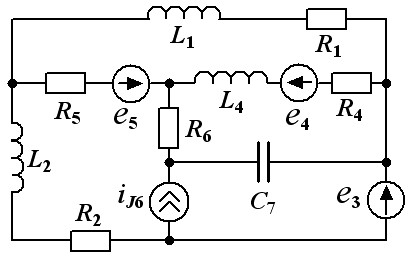
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 24 | *e*1 | *e*3 | *iJ*4 | *e*5 | *R*1 | *L*1 | *L*2 | *R*2 | *R*3 | *R*4 | *R*6 | *C*7 |
| а | 20 | 20 | 2.5 | 10 | 10 | 10 | 0 | 10 | 10 | 55 | 10 | 50 |



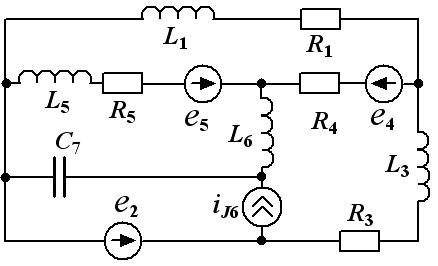
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 25 | *e*1 | *iJ*3 | *e*4 | *e*6 | *R*1 | *L*1 | *L*2 | *R*2 | *R*3 | *R*4 | *R*5 | *C*7 |
|  | 60 | 0.4 | 100 | 60 | 10 | 20 | 20 | 10 | 33 | 5 | 10 | 50 |



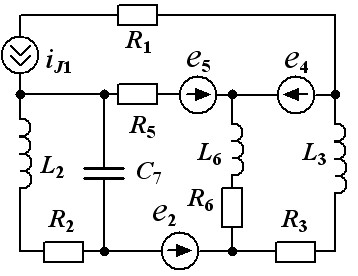
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 26 | *e*3 | *e*4 | *e*5 | *iJ*6 | *R*1 | *L*1 | *R*2 | *L*2 | *R*4 | *L*4 | *R*5 | *R*6 | *C*7 |
|  | 20 | 20 | 10 | 0.2 | 10 | 10 | 20 | 20 | 30 | 30 | 20 | 22 | 50 |



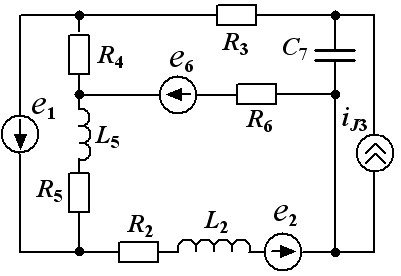
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 27 | *e*2 | *e*4 | *e*5 | *iJ*6 | *R*1 | *L*1 | *R*3 | *L*3 | *R*4 | *R*5 | *L*5 | *L*6 | *C*7 |
|  | 10 | 10 | 10 | 0.5 | 20 | 30 | 40 | 40 | 10 | 10 | 10 | 22 | 50 |



|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 28 | *iJ*1 | *e*2 | *e*4 | *e*5 | *R*1 | *R*2 | *L*2 | *L*3 | *R*3 | *R*5 | *L*6 | *R*6 | *C*7 |
|  | 1.2 | 20 | 20 | 10 | 22 | 10 | 10 | 80 | 20 | 20 | 80 | 20 | 50 |



|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 29 | *e*1 | *e*2 | *iJ*3 | *e*6 | *R*2 | *L*2 | *R*3 | *R*4 | *R*5 | *L*5 | *R*6 | *C*7 |
|  | 20 | 20 | 0.4 | 10 | 30 | 20 | 22 | 20 | 20 | 100 | 30 | 50 |



|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 30 | *e*1 | *e*3 | *iJ*4 | *e*5 | *R*1 | *R*2 | *L*2 | *R*3 | *L*3 | *R*4 | *R*6 | *C*7 |
|  | 20 | 10 | 1 | 20 | 30 | 20 | 80 | 10 | 10 | 22 | 20 | 50 |

