## *ВАРИАНТ 93 Задание на курсовую работу:*

***«Расчет линейных электрических цепей»***

Все расчеты должны быть выполнены подробно. Не допускается обобщение и сведение в таблицу однотипных расчетов. Все этапы преобразования схем должны быть представлены рисунками. Расчеты выполняются в электронном виде (Microsoft Word) в формате А4 согласно МИ (Методическая инструкция). В конце работы должен быть приведен список использованных источников.

# Задание №1

Первоначальное положение ключей К1 и К2 на схеме №1 соответствует положениям ключей «+» (замкнут), и «-» (разомкнут) в таблице №1 (R (Ом), E в (В)). Некоторое время спустя ключи К1 и К2 изменяют свое состояние. Новое положение ключей в таблице №1 соответствует столбикам К1.2 и К2.2. Вариантом (в табл.№1) являются последние две цифры шифра зачетки.

1. Определить токи во всех ветвях в первом и втором положениях ключей методами:

а) Метод контурных токов.

б) Метод узловых потенциалов. в) Метод наложения.

1. Составить баланс мощностей для первого и второго положения ключей.
2. Рассчитать величину электроэнергии, потребленную элементами схемы с учетом времени первого положения ключей t1 секунд. Времени второго положения ключей t2 секунд.



## *Схема №1*

***Таблица №1***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **№ вар** | **К1** | **К2** | **К1.2** | **К2.2** | **R1** | **R2** | **R3** | **R4** | **R5** | **R6** | **E1** | **E2** | **E3** | **E4** | **t1** | **t2** |
| 1 | + | - | - | + | 53 | 72 | 75 | 38 | 50 | 6 | 245 | 405 | 845 | 290 | 60 | 8 |
| 2 | + | - | - | + | 41 | 87 | 62 | 88 | 74 | 94 | 730 | 650 | 690 | 435 | 94 | 91 |
| 3 | + | - | - | + | 87 | 72 | 19 | 84 | 58 | 57 | 375 | 1030 | 705 | 530 | 96 | 49 |
| 4 | + | - | - | + | 33 | 47 | 6 | 28 | 42 | 5 | 815 | 290 | 675 | 375 | 57 | 82 |
| 5 | + | - | - | + | 98 | 83 | 52 | 75 | 12 | 52 | 860 | 690 | 615 | 490 | 65 | 42 |
| 6 | + | - | - | + | 49 | 6 | 91 | 11 | 59 | 77 | 345 | 205 | 720 | 415 | 3 | 65 |
| 7 | + | - | - | + | 89 | 1 | 51 | 38 | 45 | 47 | 620 | 375 | 550 | 115 | 41 | 67 |
| 8 | + | - | - | + | 30 | 93 | 66 | 85 | 42 | 24 | 430 | 460 | 435 | 890 | 60 | 41 |
| 9 | + | - | - | + | 95 | 77 | 83 | 89 | 1 | 26 | 960 | 250 | 660 | 760 | 86 | 88 |
| 10 | - | + | + | + | 97 | 69 | 86 | 88 | 61 | 38 | 215 | 445 | 350 | 660 | 70 | 54 |
| 11 | - | + | + | + | 51 | 15 | 60 | 94 | 5 | 13 | 420 | 1005 | 975 | 990 | 40 | 57 |
| 12 | - | + | + | + | 18 | 26 | 71 | 2 | 55 | 99 | 1035 | 835 | 850 | 735 | 41 | 88 |
| 13 | - | + | + | + | 64 | 33 | 80 | 10 | 22 | 17 | 915 | 950 | 375 | 730 | 45 | 99 |
| 14 | - | + | + | - | 16 | 78 | 69 | 44 | 69 | 91 | 1090 | 860 | 660 | 845 | 14 | 26 |
| 15 | - | + | + | - | 77 | 65 | 47 | 76 | 63 | 18 | 775 | 545 | 730 | 650 | 25 | 65 |
| 16 | - | + | + | - | 99 | 96 | 81 | 55 | 58 | 91 | 160 | 320 | 605 | 250 | 36 | 16 |
| 17 | - | + | + | - | 76 | 60 | 81 | 5 | 60 | 61 | 1030 | 230 | 535 | 815 | 5 | 30 |
| 18 | - | + | + | - | 75 | 11 | 38 | 7 | 34 | 17 | 375 | 335 | 915 | 615 | 89 | 8 |
| 19 | - | + | + | - | 20 | 2 | 35 | 57 | 86 | 64 | 620 | 350 | 830 | 360 | 94 | 17 |
| 20 | + | - | + | + | 25 | 19 | 75 | 52 | 65 | 88 | 1075 | 705 | 915 | 1015 | 1 | 81 |
| 21 | + | - | + | + | 65 | 24 | 61 | 6 | 52 | 43 | 890 | 160 | 360 | 320 | 82 | 6 |
| 22 | + | - | + | + | 16 | 90 | 37 | 30 | 62 | 6 | 620 | 660 | 905 | 290 | 25 | 34 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 23 | + | - | - | + | 89 | 74 | 20 | 64 | 84 | 32 | 560 | 235 | 415 | 375 | 52 | 88 |
| 24 | + | - | - | + | 27 | 34 | 23 | 63 | 9 | 13 | 375 | 650 | 630 | 505 | 41 | 15 |
| 25 | + | - | - | + | 48 | 16 | 25 | 53 | 65 | 54 | 805 | 1150 | 245 | 1015 | 8 | 81 |
| 26 | + | - | - | + | 3 | 55 | 53 | 99 | 23 | 83 | 930 | 1090 | 235 | 1105 | 40 | 62 |
| 27 | - | + | + | - | 22 | 35 | 21 | 83 | 95 | 48 | 805 | 175 | 330 | 620 | 26 | 71 |
| 28 | - | + | + | - | 51 | 76 | 44 | 47 | 40 | 60 | 735 | 630 | 115 | 775 | 38 | 26 |
| 29 | - | + | + | - | 99 | 31 | 44 | 33 | 62 | 94 | 1105 | 550 | 535 | 575 | 71 | 39 |
| 30 | - | + | + | - | 20 | 44 | 44 | 31 | 85 | 21 | 760 | 220 | 630 | 830 | 27 | 6 |
| 31 | - | + | + | - | 70 | 44 | 19 | 37 | 80 | 87 | 720 | 845 | 330 | 1005 | 21 | 6 |
| 32 | - | + | + | - | 32 | 59 | 32 | 96 | 84 | 83 | 420 | 1005 | 1075 | 935 | 37 | 34 |
| 33 | + | - | + | + | 66 | 34 | 14 | 88 | 66 | 60 | 960 | 445 | 835 | 375 | 44 | 37 |
| 34 | + | - | + | + | 48 | 62 | 13 | 8 | 85 | 4 | 345 | 245 | 945 | 635 | 6 | 93 |
| 35 | + | - | + | + | 84 | 16 | 44 | 94 | 19 | 34 | 905 | 115 | 1090 | 975 | 18 | 7 |
| 36 | + | - | - | + | 30 | 12 | 88 | 64 | 13 | 35 | 505 | 335 | 730 | 220 | 13 | 78 |
| 37 | + | - | - | + | 18 | 68 | 1 | 30 | 22 | 41 | 475 | 545 | 1020 | 1035 | 8 | 86 |
| 38 | + | - | - | + | 12 | 85 | 16 | 60 | 4 | 15 | 330 | 445 | 260 | 1005 | 100 | 15 |
| 39 | + | - | - | + | 62 | 100 | 42 | 49 | 65 | 27 | 1005 | 1120 | 520 | 430 | 60 | 84 |
| 40 | + | - | - | + | 63 | 65 | 55 | 62 | 20 | 17 | 1135 | 230 | 245 | 290 | 80 | 44 |
| 41 | + | - | - | + | 59 | 44 | 60 | 59 | 57 | 30 | 820 | 760 | 245 | 375 | 34 | 29 |
| 42 | - | + | + | + | 74 | 68 | 96 | 98 | 14 | 85 | 215 | 845 | 1050 | 1060 | 58 | 94 |
| 43 | - | + | + | + | 4 | 91 | 75 | 7 | 82 | 46 | 645 | 1120 | 705 | 805 | 90 | 74 |
| 44 | - | + | + | + | 15 | 53 | 21 | 5 | 61 | 64 | 545 | 1005 | 515 | 175 | 12 | 7 |
| 45 | - | + | + | - | 90 | 69 | 96 | 44 | 22 | 17 | 675 | 775 | 590 | 545 | 20 | 25 |
| 46 | - | + | + | - | 71 | 94 | 36 | 53 | 97 | 19 | 1030 | 1135 | 535 | 305 | 37 | 53 |
| 47 | - | + | + | - | 91 | 54 | 57 | 38 | 96 | 11 | 430 | 115 | 605 | 145 | 10 | 12 |
| 48 | - | + | + | - | 22 | 88 | 54 | 23 | 4 | 80 | 1020 | 330 | 345 | 860 | 24 | 50 |
| 49 | - | + | + | - | 98 | 32 | 23 | 6 | 82 | 24 | 145 | 290 | 845 | 705 | 48 | 52 |
| 50 | - | + | + | - | 66 | 19 | 83 | 70 | 27 | 30 | 935 | 920 | 530 | 660 | 53 | 38 |
| 51 | - | + | + | - | 87 | 27 | 90 | 44 | 86 | 73 | 160 | 635 | 1015 | 605 | 58 | 47 |
| 52 | + | - | + | + | 18 | 75 | 47 | 97 | 38 | 2 | 1090 | 850 | 505 | 615 | 65 | 30 |
| 53 | + | - | + | + | 63 | 3 | 31 | 13 | 29 | 75 | 390 | 630 | 445 | 1150 | 32 | 57 |
| 54 | + | - | + | + | 39 | 20 | 71 | 100 | 98 | 77 | 820 | 335 | 375 | 335 | 53 | 42 |
| 55 | + | - | + | + | 29 | 81 | 70 | 68 | 97 | 20 | 620 | 350 | 220 | 405 | 81 | 45 |
| 56 | + | - | - | + | 3 | 63 | 88 | 62 | 91 | 94 | 815 | 1045 | 375 | 1135 | 81 | 59 |
| 57 | + | - | - | + | 75 | 45 | 6 | 10 | 100 | 5 | 635 | 290 | 1015 | 305 | 43 | 30 |
| 58 | + | - | - | + | 93 | 56 | 26 | 11 | 15 | 40 | 660 | 405 | 420 | 720 | 36 | 70 |
| 59 | - | + | + | + | 30 | 77 | 85 | 65 | 59 | 58 | 560 | 505 | 605 | 635 | 17 | 47 |
| 60 | - | + | + | - | 73 | 82 | 53 | 40 | 66 | 72 | 115 | 960 | 390 | 530 | 19 | 52 |
| 61 | - | + | + | - | 47 | 15 | 96 | 64 | 85 | 53 | 345 | 175 | 890 | 1090 | 51 | 62 |
| 62 | - | + | + | - | 86 | 80 | 46 | 45 | 25 | 24 | 435 | 360 | 990 | 545 | 20 | 42 |
| 63 | - | + | + | - | 30 | 54 | 100 | 13 | 75 | 62 | 1075 | 745 | 620 | 350 | 20 | 76 |
| 64 | - | + | + | - | 96 | 11 | 2 | 50 | 76 | 3 | 645 | 420 | 1135 | 950 | 90 | 98 |
| 65 | + | - | + | + | 75 | 19 | 92 | 83 | 67 | 97 | 1050 | 445 | 760 | 660 | 49 | 20 |
| 66 | + | - | + | + | 14 | 83 | 42 | 90 | 72 | 96 | 435 | 660 | 305 | 335 | 58 | 99 |
| 67 | + | - | + | + | 30 | 26 | 12 | 83 | 23 | 81 | 420 | 1105 | 715 | 320 | 80 | 95 |
| 68 | + | - | + | + | 12 | 73 | 32 | 68 | 29 | 34 | 1015 | 1150 | 945 | 1030 | 86 | 54 |
| 69 | + | - | - | + | 54 | 83 | 78 | 2 | 40 | 76 | 530 | 650 | 930 | 690 | 28 | 50 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 70 | + | - | - | + | 71 | 100 | 24 | 54 | 37 | 38 | 635 | 715 | 115 | 330 | 78 | 97 |
| 71 | + | - | - | + | 87 | 7 | 54 | 38 | 86 | 79 | 205 | 450 | 675 | 575 | 30 | 14 |
| 72 | + | - | - | + | 59 | 14 | 46 | 42 | 79 | 91 | 650 | 550 | 915 | 190 | 61 | 72 |
| 73 | + | - | - | + | 12 | 100 | 27 | 35 | 25 | 84 | 635 | 745 | 760 | 260 | 51 | 87 |
| 74 | - | + | + | + | 75 | 35 | 67 | 15 | 79 | 39 | 575 | 275 | 915 | 190 | 54 | 35 |
| 75 | - | + | + | + | 57 | 43 | 53 | 78 | 75 | 33 | 705 | 935 | 660 | 160 | 1 | 87 |
| 76 | - | + | + | + | 36 | 54 | 73 | 84 | 28 | 25 | 160 | 950 | 635 | 605 | 79 | 32 |
| 77 | - | + | + | + | 94 | 88 | 23 | 60 | 3 | 76 | 335 | 975 | 160 | 350 | 66 | 94 |
| 78 | - | + | + | - | 84 | 97 | 7 | 22 | 48 | 100 | 475 | 320 | 930 | 850 | 19 | 8 |
| 79 | - | + | + | - | 33 | 80 | 88 | 91 | 71 | 85 | 1015 | 905 | 920 | 490 | 14 | 16 |
| 80 | - | + | + | - | 22 | 46 | 67 | 53 | 90 | 45 | 915 | 920 | 635 | 630 | 92 | 62 |
| 81 | - | + | + | - | 40 | 69 | 22 | 84 | 75 | 59 | 305 | 130 | 415 | 475 | 41 | 30 |
| 82 | - | + | + | - | 28 | 28 | 89 | 73 | 26 | 45 | 1060 | 450 | 615 | 335 | 54 | 33 |
| 83 | - | + | + | - | 45 | 31 | 13 | 100 | 58 | 15 | 590 | 850 | 890 | 235 | 87 | 73 |
| 84 | + | - | + | + | 76 | 43 | 56 | 10 | 98 | 25 | 175 | 235 | 660 | 1045 | 85 | 19 |
| 85 | + | - | + | + | 67 | 97 | 4 | 46 | 34 | 18 | 1005 | 130 | 675 | 630 | 55 | 69 |
| 86 | + | - | + | + | 68 | 90 | 1 | 2 | 10 | 43 | 360 | 1020 | 675 | 1015 | 100 | 91 |
| 87 | + | - | - | + | 83 | 62 | 63 | 51 | 81 | 44 | 130 | 745 | 550 | 975 | 39 | 11 |
| 88 | + | - | - | + | 53 | 22 | 11 | 55 | 89 | 51 | 250 | 360 | 650 | 1005 | 38 | 2 |
| 89 | + | - | - | + | 35 | 57 | 40 | 52 | 94 | 16 | 215 | 575 | 435 | 775 | 62 | 1 |
| 90 | + | - | - | + | 70 | 30 | 77 | 79 | 84 | 45 | 705 | 190 | 1150 | 850 | 47 | 23 |
| 91 | - | + | + | - | 56 | 65 | 13 | 42 | 19 | 89 | 650 | 335 | 605 | 590 | 18 | 23 |
| 92 | - | + | + | - | 73 | 87 | 16 | 96 | 8 | 17 | 235 | 215 | 815 | 750 | 92 | 55 |
| 93 | - | + | + | - | 43 | 20 | 39 | 76 | 29 | 61 | 990 | 475 | 650 | 1135 | 25 | 82 |
| 94 | - | + | + | - | 65 | 96 | 55 | 22 | 22 | 88 | 475 | 190 | 960 | 835 | 60 | 32 |
| 95 | - | + | + | - | 12 | 24 | 22 | 72 | 42 | 37 | 420 | 130 | 775 | 245 | 94 | 79 |
| 96 | - | + | + | - | 72 | 98 | 44 | 55 | 67 | 37 | 550 | 635 | 1105 | 690 | 27 | 5 |
| 97 | - | + | + | - | 91 | 13 | 4 | 49 | 37 | 55 | 420 | 1030 | 115 | 345 | 15 | 5 |
| 98 | - | + | + | - | 64 | 40 | 87 | 92 | 76 | 34 | 1030 | 390 | 760 | 250 | 8 | 54 |
| 99 | - | + | + | - | 65 | 78 | 91 | 67 | 59 | 55 | 515 | 490 | 915 | 750 | 55 | 63 |

**Задание №2**

E1, E2, E3, - источники синусоидального напряжения промышленной частоты, ф1, ф2, ф3 – начальные фазы источников питания. Действующие значения напряжений указаны в таблице №2.

Определить токи во всех ветвях удобным вам способом. Составить баланс мощностей. Определить амплитуды токов. Составить векторную диаграмму токов узла «а», а также векторную диаграмму суммы падений напряжений на элементах C1, R6, R1 и E1, E2.



## *Схема №2*

***Таблица №2***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **№ вар** | **R1** | **R2** | **R3** | **R4** | **R5** | **R6** | **L1****мГн** | **L2****мГн** | **C1****мкФ** | **E1** | **E2** | **E3** | ᵩ1 | ᵩ2 | ᵩ3 |
| 1 | 80 | 27 | 97 | 12 | 53 | 60 | 20 | 5 | 11 | 245 | 1020 | 875 | 57 | 22 | 46 |
| 2 | 30 | 81 | 52 | 3 | 34 | 31 | 10 | 4 | 12 | 115 | 530 | 245 | 72 | 46 | 52 |
| 3 | 55 | 23 | 29 | 85 | 19 | 15 | 14 | 5 | 11 | 160 | 320 | 820 | 23 | 5 | 44 |
| 4 | 37 | 55 | 79 | 92 | 70 | 4 | 17 | 4 | 9 | 1120 | 220 | 405 | 21 | 70 | 8 |
| 5 | 66 | 94 | 11 | 61 | 82 | 82 | 19 | 20 | 11 | 860 | 160 | 530 | 31 | 36 | 46 |
| 6 | 48 | 18 | 97 | 14 | 42 | 13 | 3 | 6 | 10 | 545 | 635 | 1060 | 94 | 37 | 17 |
| 7 | 48 | 83 | 29 | 31 | 41 | 97 | 28 | 17 | 1 | 990 | 305 | 760 | 62 | 53 | 68 |
| 8 | 28 | 94 | 94 | 32 | 70 | 14 | 19 | 8 | 4 | 345 | 1030 | 360 | 18 | 94 | 1 |
| 9 | 11 | 14 | 93 | 65 | 44 | 3 | 29 | 8 | 6 | 515 | 620 | 215 | 93 | 34 | 46 |
| 10 | 37 | 53 | 77 | 45 | 19 | 85 | 20 | 29 | 3 | 650 | 1035 | 890 | 73 | 62 | 69 |
| 11 | 42 | 33 | 25 | 29 | 37 | 44 | 16 | 15 | 9 | 745 | 275 | 690 | 61 | 61 | 27 |
| 12 | 33 | 86 | 82 | 77 | 76 | 84 | 6 | 3 | 9 | 875 | 530 | 1005 | 46 | 84 | 44 |
| 13 | 99 | 64 | 82 | 51 | 43 | 11 | 11 | 6 | 10 | 715 | 675 | 250 | 3 | 27 | 33 |
| 14 | 72 | 7 | 76 | 9 | 76 | 84 | 7 | 4 | 1 | 815 | 590 | 1015 | 72 | 85 | 89 |
| 15 | 18 | 31 | 66 | 68 | 42 | 100 | 6 | 14 | 9 | 645 | 990 | 405 | 21 | 23 | 7 |
| 16 | 93 | 8 | 85 | 75 | 98 | 24 | 23 | 7 | 10 | 220 | 630 | 1020 | 19 | 95 | 94 |
| 17 | 53 | 47 | 42 | 29 | 47 | 75 | 25 | 28 | 8 | 1020 | 1030 | 315 | 83 | 53 | 97 |
| 18 | 33 | 82 | 40 | 28 | 61 | 29 | 9 | 18 | 2 | 1020 | 215 | 930 | 29 | 78 | 66 |
| 19 | 63 | 93 | 49 | 12 | 7 | 84 | 7 | 18 | 5 | 475 | 850 | 1150 | 82 | 72 | 60 |
| 20 | 9 | 92 | 92 | 67 | 66 | 22 | 19 | 19 | 1 | 690 | 450 | 260 | 7 | 97 | 9 |
| 21 | 89 | 35 | 54 | 61 | 78 | 22 | 11 | 14 | 12 | 220 | 990 | 315 | 34 | 99 | 64 |
| 22 | 80 | 46 | 37 | 34 | 32 | 23 | 10 | 15 | 11 | 975 | 835 | 420 | 99 | 40 | 15 |
| 23 | 59 | 13 | 70 | 4 | 13 | 19 | 6 | 13 | 1 | 375 | 130 | 990 | 97 | 55 | 83 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 24 | 91 | 42 | 55 | 57 | 66 | 68 | 11 | 24 | 2 | 190 | 360 | 550 | 20 | 68 | 1 |
| 25 | 38 | 13 | 38 | 34 | 29 | 42 | 26 | 11 | 1 | 1050 | 615 | 730 | 25 | 59 | 45 |
| 26 | 2 | 83 | 79 | 51 | 19 | 13 | 24 | 24 | 2 | 1120 | 560 | 260 | 94 | 71 | 48 |
| 27 | 59 | 36 | 54 | 53 | 14 | 94 | 10 | 28 | 11 | 730 | 435 | 1015 | 68 | 34 | 100 |
| 28 | 77 | 62 | 51 | 19 | 75 | 72 | 4 | 18 | 9 | 460 | 520 | 615 | 83 | 75 | 82 |
| 29 | 9 | 37 | 87 | 76 | 12 | 96 | 7 | 14 | 8 | 520 | 490 | 390 | 23 | 49 | 9 |
| 30 | 12 | 47 | 94 | 46 | 78 | 64 | 26 | 6 | 8 | 1090 | 450 | 690 | 48 | 68 | 43 |
| 31 | 81 | 25 | 28 | 9 | 99 | 44 | 3 | 10 | 1 | 675 | 935 | 420 | 31 | 31 | 69 |
| 32 | 40 | 42 | 78 | 43 | 34 | 79 | 16 | 26 | 10 | 115 | 520 | 575 | 51 | 85 | 39 |
| 33 | 7 | 12 | 75 | 12 | 74 | 26 | 29 | 17 | 6 | 630 | 290 | 920 | 52 | 28 | 28 |
| 34 | 6 | 86 | 15 | 3 | 83 | 83 | 6 | 28 | 6 | 945 | 860 | 750 | 8 | 60 | 43 |
| 35 | 72 | 49 | 28 | 58 | 36 | 49 | 6 | 6 | 5 | 220 | 820 | 930 | 48 | 69 | 96 |
| 36 | 95 | 12 | 13 | 63 | 30 | 11 | 12 | 24 | 7 | 1150 | 315 | 945 | 20 | 100 | 76 |
| 37 | 32 | 59 | 35 | 70 | 36 | 89 | 8 | 3 | 3 | 745 | 445 | 630 | 26 | 11 | 73 |
| 38 | 10 | 55 | 82 | 68 | 7 | 13 | 7 | 8 | 10 | 1075 | 350 | 215 | 18 | 100 | 11 |
| 39 | 85 | 45 | 89 | 62 | 99 | 72 | 24 | 21 | 1 | 945 | 590 | 430 | 65 | 49 | 44 |
| 40 | 83 | 96 | 20 | 16 | 45 | 5 | 28 | 14 | 7 | 530 | 930 | 330 | 37 | 41 | 70 |
| 41 | 76 | 47 | 47 | 19 | 76 | 92 | 23 | 22 | 7 | 1015 | 915 | 705 | 85 | 68 | 41 |
| 42 | 18 | 40 | 32 | 75 | 70 | 96 | 27 | 22 | 8 | 215 | 505 | 1020 | 88 | 6 | 84 |
| 43 | 21 | 16 | 99 | 11 | 27 | 8 | 14 | 3 | 11 | 435 | 435 | 735 | 63 | 34 | 5 |
| 44 | 83 | 44 | 100 | 65 | 100 | 54 | 4 | 26 | 3 | 650 | 805 | 560 | 7 | 91 | 58 |
| 45 | 71 | 13 | 80 | 77 | 17 | 15 | 12 | 8 | 5 | 745 | 845 | 975 | 73 | 76 | 14 |
| 46 | 43 | 29 | 30 | 53 | 69 | 50 | 4 | 30 | 4 | 720 | 1005 | 490 | 57 | 15 | 65 |
| 47 | 97 | 62 | 71 | 25 | 52 | 88 | 30 | 15 | 2 | 330 | 460 | 1030 | 7 | 95 | 31 |
| 48 | 41 | 30 | 59 | 64 | 86 | 62 | 28 | 30 | 7 | 920 | 935 | 175 | 1 | 100 | 86 |
| 49 | 30 | 50 | 65 | 76 | 49 | 17 | 28 | 18 | 6 | 505 | 130 | 530 | 17 | 4 | 37 |
| 50 | 69 | 55 | 49 | 55 | 15 | 9 | 17 | 4 | 11 | 360 | 630 | 990 | 16 | 39 | 1 |
| 51 | 93 | 3 | 22 | 55 | 36 | 40 | 13 | 16 | 4 | 335 | 650 | 375 | 96 | 8 | 15 |
| 52 | 67 | 68 | 71 | 93 | 35 | 43 | 9 | 4 | 2 | 830 | 760 | 950 | 50 | 46 | 29 |
| 53 | 73 | 81 | 89 | 70 | 98 | 65 | 25 | 4 | 2 | 815 | 675 | 835 | 54 | 78 | 81 |
| 54 | 39 | 52 | 56 | 21 | 86 | 75 | 11 | 14 | 12 | 1105 | 1035 | 1030 | 52 | 9 | 13 |
| 55 | 58 | 54 | 88 | 23 | 48 | 28 | 23 | 11 | 11 | 1035 | 360 | 720 | 83 | 44 | 75 |
| 56 | 12 | 73 | 16 | 12 | 31 | 35 | 5 | 27 | 4 | 1090 | 720 | 1060 | 40 | 97 | 4 |
| 57 | 4 | 55 | 60 | 6 | 86 | 56 | 25 | 5 | 10 | 945 | 905 | 215 | 64 | 7 | 19 |
| 58 | 73 | 45 | 63 | 69 | 1 | 90 | 12 | 22 | 5 | 420 | 945 | 115 | 52 | 41 | 43 |
| 59 | 14 | 48 | 70 | 3 | 29 | 75 | 17 | 17 | 4 | 250 | 850 | 760 | 13 | 2 | 51 |
| 60 | 80 | 95 | 64 | 37 | 1 | 70 | 8 | 27 | 1 | 550 | 1045 | 250 | 91 | 70 | 56 |
| 61 | 29 | 26 | 47 | 9 | 53 | 85 | 8 | 17 | 3 | 835 | 335 | 245 | 2 | 12 | 84 |
| 62 | 33 | 30 | 52 | 31 | 9 | 74 | 26 | 16 | 11 | 660 | 960 | 735 | 19 | 71 | 68 |
| 63 | 60 | 95 | 100 | 59 | 13 | 53 | 7 | 5 | 10 | 160 | 420 | 690 | 65 | 40 | 40 |
| 64 | 93 | 55 | 28 | 100 | 56 | 27 | 18 | 30 | 1 | 735 | 405 | 815 | 100 | 31 | 27 |
| 65 | 11 | 71 | 7 | 87 | 58 | 14 | 9 | 20 | 11 | 850 | 420 | 1105 | 35 | 43 | 83 |
| 66 | 96 | 82 | 85 | 23 | 48 | 67 | 4 | 12 | 8 | 145 | 830 | 590 | 20 | 68 | 3 |
| 67 | 31 | 35 | 64 | 82 | 93 | 86 | 17 | 29 | 10 | 230 | 890 | 935 | 75 | 30 | 71 |
| 68 | 66 | 90 | 35 | 9 | 93 | 91 | 21 | 21 | 2 | 305 | 850 | 750 | 100 | 84 | 9 |
| 69 | 84 | 93 | 21 | 38 | 16 | 9 | 5 | 14 | 1 | 950 | 245 | 960 | 36 | 70 | 37 |
| 70 | 43 | 22 | 2 | 20 | 31 | 5 | 7 | 12 | 4 | 815 | 1020 | 230 | 31 | 90 | 54 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 71 | 34 | 46 | 88 | 72 | 7 | 70 | 12 | 28 | 4 | 545 | 1075 | 1075 | 21 | 8 | 35 |
| 72 | 10 | 82 | 12 | 67 | 80 | 95 | 17 | 25 | 10 | 530 | 1015 | 115 | 23 | 70 | 74 |
| 73 | 82 | 65 | 95 | 25 | 76 | 98 | 6 | 13 | 7 | 705 | 1005 | 230 | 60 | 46 | 65 |
| 74 | 6 | 81 | 48 | 94 | 19 | 30 | 6 | 13 | 11 | 230 | 790 | 1060 | 29 | 42 | 4 |
| 75 | 78 | 8 | 76 | 96 | 3 | 98 | 29 | 8 | 7 | 905 | 345 | 890 | 35 | 92 | 2 |
| 76 | 24 | 19 | 92 | 90 | 18 | 9 | 28 | 18 | 5 | 420 | 175 | 1050 | 93 | 51 | 69 |
| 77 | 14 | 79 | 17 | 51 | 16 | 53 | 3 | 12 | 7 | 435 | 775 | 905 | 21 | 6 | 39 |
| 78 | 83 | 47 | 55 | 35 | 50 | 59 | 24 | 9 | 4 | 890 | 1060 | 930 | 18 | 1 | 80 |
| 79 | 54 | 16 | 93 | 36 | 88 | 87 | 30 | 12 | 1 | 160 | 205 | 245 | 38 | 77 | 34 |
| 80 | 72 | 18 | 88 | 23 | 46 | 37 | 25 | 7 | 6 | 230 | 345 | 690 | 68 | 67 | 38 |
| 81 | 68 | 51 | 42 | 37 | 24 | 30 | 10 | 14 | 12 | 945 | 950 | 1050 | 38 | 94 | 56 |
| 82 | 32 | 8 | 48 | 32 | 68 | 64 | 25 | 28 | 7 | 650 | 845 | 605 | 36 | 58 | 81 |
| 83 | 96 | 18 | 62 | 53 | 53 | 15 | 24 | 13 | 10 | 175 | 705 | 590 | 100 | 82 | 82 |
| 84 | 64 | 41 | 50 | 19 | 12 | 11 | 11 | 9 | 8 | 160 | 1090 | 1090 | 63 | 25 | 9 |
| 85 | 33 | 76 | 74 | 65 | 79 | 58 | 13 | 20 | 10 | 1020 | 635 | 1075 | 15 | 63 | 91 |
| 86 | 61 | 49 | 56 | 28 | 37 | 66 | 19 | 25 | 4 | 1015 | 475 | 630 | 74 | 35 | 98 |
| 87 | 4 | 16 | 93 | 35 | 87 | 46 | 25 | 8 | 7 | 360 | 515 | 605 | 84 | 76 | 38 |
| 88 | 88 | 2 | 68 | 80 | 84 | 40 | 14 | 15 | 1 | 860 | 160 | 220 | 26 | 17 | 5 |
| 89 | 47 | 22 | 40 | 26 | 81 | 55 | 17 | 19 | 10 | 850 | 1030 | 1060 | 99 | 23 | 43 |
| 90 | 83 | 69 | 31 | 29 | 57 | 17 | 4 | 23 | 11 | 515 | 1075 | 415 | 73 | 52 | 45 |
| 91 | 82 | 77 | 57 | 10 | 5 | 88 | 8 | 20 | 10 | 345 | 515 | 1005 | 61 | 36 | 31 |
| 92 | 21 | 47 | 36 | 35 | 13 | 98 | 30 | 12 | 1 | 745 | 560 | 635 | 56 | 26 | 32 |
| 93 | 76 | 9 | 1 | 51 | 69 | 78 | 13 | 22 | 8 | 850 | 475 | 750 | 72 | 81 | 82 |
| 94 | 49 | 58 | 7 | 7 | 58 | 54 | 18 | 12 | 9 | 250 | 660 | 260 | 58 | 8 | 73 |
| 95 | 61 | 20 | 75 | 43 | 75 | 73 | 3 | 29 | 2 | 260 | 1050 | 845 | 54 | 89 | 47 |
| 96 | 73 | 33 | 70 | 36 | 62 | 57 | 11 | 12 | 7 | 420 | 845 | 820 | 87 | 31 | 39 |
| 97 | 92 | 10 | 4 | 65 | 79 | 63 | 5 | 24 | 4 | 415 | 350 | 330 | 80 | 84 | 30 |
| 98 | 11 | 59 | 8 | 41 | 77 | 6 | 9 | 3 | 11 | 1105 | 920 | 1105 | 13 | 46 | 93 |
| 99 | 6 | 40 | 35 | 20 | 47 | 60 | 14 | 10 | 9 | 1045 | 250 | 675 | 80 | 77 | 28 |