Table 11Tasks 1,3,4 Robots 2,3,4,5 Stations Results Ratio (1:0)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Ratio(1:0) | |  | 11Tasks | |
|  |  |  | Number of stations | | | |
|  |  |  | 2 | 3 | 4 | 5 |
| Number pf robots | 1 | CT | 372 | 251 | 192 | 164 |
| EN | 259 | 259 | 259 | 259 |
| η | 99.00% | 98.00% | 97% | 90% |
| 3 | CT | 252 | 162 | 125 | 109 |
| EN | 160.85 | 155 | 143.45 | 140.5 |
| η | 98.00% | 96.00% | 89% | 80.00% |
| 4 | CT | 253 | 175 | 121 | 94 |
| EN | 170.3 | 169.4 | 169 | 157.8 |
| η | 96.60% | 97.00% | 96.00% | 96% |

Table 11Tasks 1,3,4 Robots 2,3,4,5 Stations Results Ratio (0.5:0.5)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Ratio(0.5:0.5) | |  | 11Tasks- | |
|  |  |  | Number of stations | | | |
|  |  |  | 2 | 3 | 4 | 5 |
| Number pf robots | 1 | CT | 372 | 251 | 192 | 164 |
| EN | 259 | 259 | 259 | 259 |
| η | 99.00% | 98.00% | 97% | 90% |
| 3 | CT | 252 | 162 | 125 | 109 |
| EN | 160.85 | 153 | 143.45 | 140.5 |
| η | 98.00% | 96.00% | 89% | 80.00% |
| 4 | CT | 253 | 178 | 121 | 94 |
| EN | 170.3 | 156.3 | 158.1 | 148.35 |
| η | 96.60% | 93.00% | 93.30% | 96% |

Table 11Tasks 1,3,4 Robots 2,3,4,5 Stations Results Ratio (0:1)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Ratio(0:1) | |  | 11Tasks- | |
|  |  |  | Number of stations | | | |
|  |  |  | 2 | 3 | 4 | 5 |
| Number pf robots | 1 | CT | 664 | 664 | 659 | 659 |
| EN | 259 | 259 | 259 | 259 |
| η | 55.00% | 37.00% | 78% | 82% |
| 3 | CT | 406 | 241 | 162 | 245 |
| EN | 149.45 | 146.85 | 138 | 138 |
| η | 60.00% | 63.00% | 63% | 56.00% |
| 4 | CT | 353 | 353 | 353 | 140 |
| EN | 156.3 | 151.4 | 150.25 | 146.5 |
| η | 70.30% | 45.60% | 33.00% | 65% |

Table 25 tasks 1,3,4,5,6 Robots 4,5,7,9,12 Stations Results Ratio (1:0)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Ratio (1:0) | |  | 25 Tasks- | |
|  |  |  | Number of stations | | | |  |
|  |  |  | 4 | 5 | 7 | 9 | 12 |
| Number of robots | 1 | CT | 548 | 446 | 326 | 252 | 200 |
| EN | 757.05 | 757.05 | 757.05 | 757.05 | 757.05 |
| η | 98.67% | 96.99% | 95% | 95% | 90% |
| 3 | CT | 275 | 224 | 164 | 129 | 96 |
| EN | 417.55 | 410.2 | 408.2 | 407.9 | 399.3 |
| η | 98.00% | 96.33% | 94% | 96% | 92% |
| 4 | CT | 318 | 250 | 188 | 145 | 110 |
| EN | 374.7 | 368.7 | 373.2 | 357.3 | 353.4 |
| η | 98.18% | 98.32% | 95% | 91.26% | 89.24% |
| 5 | CT | 309 | 244 | 184 | 135 | 100 |
| EN | 427.3 | 375.9 | 402.9 | 362.9 | 356.7 |
| η | 98.86% | 96.00% | 95.18% | 93% | 92% |
| 6 | CT | 275 | 223 | 164 | 124 | 93 |
| EN | 403.9 | 383.2 | 386.1 | 385.5 | 353.4 |
| η | 98.00% | 95.60% | 94.20% | 94% | 90% |

Table 25 tasks 1,3,4,5,6 Robots 4,5,7,9,12 Stations Results Ratio (0.5:0.5)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Ratio(0.5 -0.5) | |  |  | 25 Tasks- | |
|  |  |  | Number of stations | | | |  |
|  |  |  | 4 | 5 | 7 | 9 | 12 |
| Number of robots | 1 | CT | 553 | 442 | 331 | 257 | 200 |
| EN | 757.05 | 757.05 | 757.05 | 757.05 | 757.05 |
| η | 97.78% | 97.87% | 93% | 86% | 90% |
| 3 | CT | 286 | 234 | 165 | 136 | 100 |
| EN | 399.6 | 399.95 | 398.95 | 380.25 | 379.7 |
| η | 93.00% | 94.70% | 91% | 84% | 82% |
| 4 | CT | 318 | 254 | 193 | 151 | 110 |
| EN | 370.5 | 354.9 | 353.1 | 346.8 | 344.4 |
| η | 97.00% | 93.14% | 87% | 85.00% | 86.94% |
| 5 | CT | 323 | 254 | 194 | 137 | 101 |
| EN | 367.5 | 354.9 | 350.4 | 355.4 | 342.2 |
| η | 94.81% | 93.13% | 82.10% | 89% | 87% |
| 6 | CT | 281 | 234 | 166 | 129 | 93 |
| EN | 383.3 | 352.3 | 353.1 | 341.8 | 333.1 |
| η | 97.60% | 94.20% | 91.80% | 86% | 86% |

Table 25 tasks 1,3,4,5,6 Robots 4,5,7,9,12 Stations Results Ratio (0:1)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Ratio(0 -1) | |  |  | 25 Tasks- | |
|  |  |  | Number of stations | | | |  |
|  |  |  | 4 | 5 | 7 | 9 | 12 |
| Number of robots | 1 | CT | 2087 | 2087 | 2087 | 2087 | 2087 |
| EN | 757.05 | 757.05 | 757.05 | 757.05 | 757.05 |
| η | 26.00% | 21.00% | 14% | 12% | 9% |
| 3 | CT | 483 | 344 | 303 | 219 | 186 |
| EN | 391.3 | 387.8 | 379.65 | 378.2 | 378.2 |
| η | 53.98% | 61.27% | 49% | 53% | 46% |
| 4 | CT | 441 | 441 | 441 | 244 | 244 |
| EN | 348.9 | 348 | 344.4 | 342 | 359.6 |
| η | 65.92% | 52.60% | 37% | 51.91% | 88.66% |
| 5 | CT | 441 | 441 | 397 | 289 | 239 |
| EN | 348.9 | 344.4 | 338.6 | 335 | 331.4 |
| η | 65.92% | 51.47% | 39.79% | 42% | 38% |
| 6 | CT | 441 | 441 | 441 | 219 | 174 |
| EN | 348.9 | 344.4 | 336.9 | 329.1 | 321.2 |
| η | 66.00% | 51.47% | 34.51% | 50% | 48% |

Table 7 35 Tasks 1,3,5,9,12 Robots 4,5,7,9,12 Stations Ratio(1:0)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Ratio(1:0) | |  |  | 35 Tasks | |
|  |  |  | Number of stations | | | |  |
|  |  |  | 4 | 5 | 7 | 9 | 12 |
| No. of Robots | 1 | CT | 494 | 396 | 286 | 224 | 170 |
| EN | 1765.8 | 1765.8 | 1765 | 1765.8 | 1765 |
| η | 97% | 99% | 92% | 96% | 96% |
| 3 | CT | 399 | 301 | 207 | 161 | 120 |
| EN | 1149.9 | 988.5 | 863.6 | 973.1 | 894.9 |
| η | 99% | 96.00% | 93% | 97% | 95% |
| 5 | CT | 338 | 262 | 175 | 137 |  |
| EN | 974.5 | 862 | 821.1 | 880.9 |  |
| η | 99.40% | 96% | 98% | 97% |  |
| 9 | CT | 319 | 246 | 167 | 126 |  |
| EN | 944.2 | 852.6 | 767 | 759.9 |  |
| η | 98.74% | 99% | 93% | 94% |  |
| 12 | CT | 302 | 237 | 181 |  | 98 |
| EN | 864.8 | 851.5 | 727.7 |  | 821 |
| η | 98.8 | 97 | 93% |  | 90% |

Table 35 Tasks 1,3,5,9,12 Robots 4,5,7,9,12 Stations Ratio(0.5:0.5)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Ratio(0.5:0.5) | |  |  | 35 Tasks | |
|  |  |  | Number of stations | | | |  |
|  |  |  | 4 | 5 | 7 | 9 | 12 |
| No. of Robots | 1 | CT | 493 | 414 | 296 | 229 | 174 |
| EN | 1766 | 1766 | 1766 | 1766 | 1766 |
| η | 99% | 95% | 95% | 95% | 94 |
| 3 | CT | 411 | 335 | 232 | 189 | 132 |
| EN | 837.1 | 842 | 824 | 781 | 781.7 |
| η | 97% | 97.00% | 89% | 94% | 86% |
| 5 | CT | 354 | 311 | 211 | 163 | 131 |
| EN | 862.9 | 805.6 | 778 | 732.1 | 702.4 |
| η | 98.00% | 88% | 85% | 89% | 78% |
| 9 | CT | 345 | 275 | 191 | 131 | 112 |
| EN | 715.9 | 710.8 | 667 | 645.4 | 595.9 |
| η | 94.00% | 92% | 89% | 91% | 76% |
| 12 | CT | 345 | 275 | 198 | 153 | 121 |
| EN | 773 | 710.8 | 573.2 | 612.5 | 592 |
| η | 91% | 97% | 88% | 81% | 71% |

Table 9 35 Tasks 1,3,5,9,12 Robots 4,5,7,9,12 Stations Ratio(0:1)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Ratio(0:1) | |  |  |  | 35 Tasks | |
|  |  | Number of stations | | | |  |  |
|  |  |  | 4 | 5 | 7 | 9 | 12 |
| No. of Robots | 1 | CT | 1481 | 657 | 525 | 579 | 1785 |
| EN | 1765.8 | 1765.8 | 1765.8 | 1765.8 | 1765.8 |
| η | 33% | 59% | 53% | 38% | 9.10% |
| 3 | CT | 1053 | 497 | 381 | 344 | 163 |
| EN | 822.5 | 803 | 778 | 774 | 772 |
| η | 37% | 60.30% | 53% | 44% | 69% |
| 5 | CT | 795 | 614 | 614 | 256 | 155 |
| EN | 795 | 764 | 735 | 723.5 | 707 |
| η | 50.00% | 48% | 32% | 60% | 68% |
| 9 | CT | 345 | 345 | 345 | 189 | 151 |
| EN | 716 | 684.6 | 650.8 | 622.6 | 586.5 |
| η | 94.00% | 79% | 47% | 66% | 89% |
| 12 | CT | 577 | 331 | 339 | 189 | 153 |
| EN | 704.5 | 690.4 | 643 | 622.6 | 582.3 |
| η | 56% | 93% | 50% | 66% | 56.2 |