

| Sr. No. | Page No. | No. Of Words(y_i) | y_i^2 |
|---------|--------------|-----------------------|--------------|
| 1 | 58 | 26 | 676 |
| 2 | 83 | 16 | 256 |
| 3 | 361 | 35 | 1225 |
| 4 | 116 | 18 | 324 |
| 5 | 85 | 18 | 324 |
| 6 | 192 | 25 | 625 |
| 7 | 291 | 29 | 841 |
| 8 | 358 | 26 | 676 |
| 9 | 181 | 16 | 256 |
| 10 | 114 | 17 | 289 |
| 11 | 46 | 15 | 225 |
| 12 | 539 | 11 | 121 |
| 13 | 176 | 12 | 144 |
| 14 | 125 | 13 | 169 |
| 15 | 238 | 22 | 484 |
| 16 | 20 | 8 | 64 |
| 17 | 529 | 33 | 1089 |
| 18 | 49 | 8 | 64 |
| 19 | 35 | 19 | 361 |
| 20 | 388 | 34 | 1156 |
| 21 | 15 | 19 | 361 |
| 22 | 82 | 31 | 961 |
| 23 | 216 | 24 | 576 |
| 24 | 368 | 25 | 625 |
| 25 | 385 | 15 | 225 |
| 26 | 295 | 29 | 841 |
| 27 | 306 | 31 | 961 |
| 28 | 20 | 24 | 576 |
| | Total | 599 | 14495 |

| Signature Per Sheet(y_i) | No. Of Sheets(f_i) | $f_i y_i$ | $f_i y_i^2$ |
|------------------------------|------------------------|-----------|-------------|
| 50 | 5 | 250 | 12500 |
| 48 | 7 | 336 | 16128 |
| 45 | 3 | 135 | 6075 |
| 43 | 2 | 86 | 3698 |
| 41 | 3 | 123 | 5043 |
| 39 | 2 | 78 | 3042 |
| 35 | 2 | 70 | 2450 |
| 32 | 2 | 64 | 2048 |
| 30 | 1 | 30 | 900 |
| 29 | 1 | 29 | 841 |
| 25 | 3 | 75 | 1875 |
| 22 | 2 | 44 | 968 |
| 16 | 1 | 16 | 256 |
| 4 | 2 | 8 | 32 |
| 3 | 4 | 12 | 36 |
| Total | 40 | 1356 | 55892 |

| Sr. No. | Population in Thousands | y_i | No. Of Cities(f_i) | $f_i y_i$ | $f_i y_i^2$ |
|---------|-------------------------|-------|------------------------|-----------|-------------|
| 1 | 50-100 | 75 | 25 | 1875 | 140625 |
| 2 | 100-150 | 125 | 19 | 2375 | 296875 |
| 3 | 150-200 | 175 | 15 | 2625 | 459375 |
| 4 | 200-250 | 225 | 13 | 2925 | 658125 |
| 5 | 250-300 | 275 | 22 | 6050 | 1663750 |
| 6 | 300-350 | 325 | 32 | 10400 | 3380000 |
| 7 | 350-400 | 375 | 15 | 5625 | 2109375 |
| 8 | 400-450 | 425 | 17 | 7225 | 3070625 |
| 9 | 450-500 | 475 | 11 | 5225 | 2481875 |
| 10 | 500-550 | 525 | 8 | 4200 | 2205000 |
| 11 | 550-600 | 575 | 6 | 3450 | 1983750 |
| 12 | 600-650 | 625 | 2 | 1250 | 781250 |
| 13 | 650-700 | 675 | 1 | 675 | 455625 |
| 14 | 700-750 | 725 | 3 | 2175 | 1576875 |
| 15 | 750-950 | 850 | 2 | 1700 | 1445000 |
| 16 | 950-1150 | 1050 | 3 | 3150 | 3307500 |
| 17 | 1150-1400 | 1275 | 2 | 2550 | 3251250 |
| 18 | 1400-1900 | 1650 | 1 | 1650 | 2722500 |
| 19 | 1900-2150 | 2025 | 2 | 4050 | 8201250 |
| 20 | 2150-2500 | 2325 | 2 | 4650 | 10811250 |
| | | Total | 201 | 73825 | 51001875 |

| | 1st Stratum | |
|-------|-------------------------------|----------|
| S.No. | y_i | y_i^2 |
| 1 | 1100 | 1210000 |
| 2 | 1079 | 1164241 |
| 3 | 963 | 927369 |
| 4 | 956 | 913936 |
| 5 | 915 | 837225 |
| 6 | 879 | 772641 |
| 7 | 879 | 772641 |
| 8 | 870 | 756900 |
| 9 | 822 | 675684 |
| 10 | 818 | 669124 |
| 11 | 789 | 622521 |
| 12 | 785 | 616225 |
| 13 | 738 | 544644 |
| 14 | 717 | 514089 |
| 15 | 714 | 509796 |
| 16 | 693 | 480249 |
| Total | 13717 | 11987285 |

| | 2nd Stratum | |
|-------|-------------------------------|----------|
| S.No. | y_i | y_i^2 |
| 1 | 659 | 434281 |
| 2 | 652 | 425104 |
| 3 | 651 | 423801 |
| 4 | 640 | 409600 |
| 5 | 637 | 405769 |
| 6 | 636 | 404496 |
| 7 | 629 | 395641 |
| 8 | 614 | 376996 |
| 9 | 609 | 370881 |
| 10 | 601 | 361201 |
| 11 | 582 | 338724 |
| 12 | 581 | 337561 |
| 13 | 580 | 336400 |
| 14 | 572 | 327184 |
| 15 | 569 | 323761 |
| 16 | 566 | 320356 |
| 17 | 563 | 316969 |
| 18 | 559 | 312481 |
| 19 | 552 | 304704 |
| 20 | 541 | 292681 |
| 21 | 526 | 276676 |
| 22 | 520 | 270400 |
| 23 | 510 | 260100 |
| 24 | 489 | 239121 |
| 25 | 483 | 233289 |
| 26 | 461 | 212521 |
| 27 | 457 | 208849 |
| 28 | 444 | 197136 |
| 29 | 378 | 142884 |
| 30 | 350 | 122500 |
| 31 | 347 | 120409 |
| 32 | 336 | 112896 |
| 33 | 332 | 110224 |
| 34 | 301 | 90601 |
| 35 | 290 | 84100 |
| 36 | 289 | 83521 |
| 37 | 284 | 80656 |
| 38 | 273 | 74529 |
| 39 | 273 | 74529 |
| 40 | 264 | 69696 |
| 41 | 232 | 53824 |
| 42 | 220 | 48400 |
| 43 | 203 | 41209 |
| 44 | 182 | 33124 |
| 45 | 165 | 27225 |
| 46 | 163 | 26569 |
| 47 | 154 | 23716 |
| 48 | 124 | 15376 |
| Total | 21043 | 10552671 |

| Strata | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Strata Total T_{0j} |
|--|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|---|
| A | 0 | 1 | 1 | 2 | 5 | 4 | 7 | 7 | 8 | 6 | 41 |
| B | 6 | 8 | 9 | 10 | 13 | 12 | 15 | 16 | 16 | 17 | 122 |
| C | 18 | 19 | 20 | 20 | 24 | 23 | 25 | 28 | 29 | 27 | 233 |
| D | 26 | 30 | 31 | 31 | 33 | 32 | 35 | 37 | 38 | 38 | 331 |
| Sample Total ($n\bar{y}_{i0}$) | 50 | 58 | 61 | 63 | 75 | 71 | 82 | 88 | 91 | 88 | $\Sigma T_{ij} = 727$ |

Sample Units

| | | | | |
|-----|-----|-----|-----|-----|
| 320 | 455 | 334 | 325 | 328 |
| 340 | 417 | 331 | 358 | 383 |
| 398 | 420 | 340 | 430 | 383 |
| 360 | 358 | 370 | 358 | 375 |
| 350 | 400 | 375 | 378 | 308 |
| 372 | 355 | 320 | 395 | 400 |

| | 1st Class | |
|--------------|-----------------------------|---------------------------|
| | y_i | y_i^2 |
| 320 | -40 | 1600 |
| 340 | -20 | 400 |
| 398 | 38 | 1444 |
| 360 | 0 | 0 |
| 350 | -10 | 100 |
| 372 | 12 | 144 |
| Total | -20 | 3688 |

| | 2nd Class | |
|--------------|-----------------------------|---------------------------|
| | y_i | y_i^2 |
| 455 | 95 | 9025 |
| 417 | 57 | 3249 |
| 420 | 60 | 3600 |
| 358 | -2 | 4 |
| 400 | 40 | 1600 |
| 355 | -5 | 25 |
| Total | 245 | 17503 |

| | 3rd Class | |
|--------------|-----------------------------|---------------------------|
| | y_i | y_i^2 |
| 334 | -26 | 676 |
| 331 | -29 | 841 |
| 340 | -20 | 400 |
| 370 | 10 | 100 |
| 375 | 15 | 225 |
| 320 | -40 | 1600 |
| Total | -90 | 3842 |

| | 4th Class | |
|--------------|-----------------------------|---------------------------|
| | y_i | y_i^2 |
| 325 | -35 | 1225 |
| 358 | -2 | 4 |
| 430 | 70 | 4900 |
| 358 | -2 | 4 |
| 378 | 18 | 324 |
| 395 | 35 | 1225 |
| Total | 84 | 7682 |

| | 5th Class | |
|--------------|-----------------------------|---------------------------|
| | y_i | y_i^2 |
| 328 | -32 | 1024 |
| 383 | 23 | 529 |
| 383 | 23 | 529 |
| 375 | 15 | 225 |
| 308 | -52 | 2704 |
| 400 | 40 | 1600 |
| Total | 17 | 6611 |

| BLOCKS | | | | | | | |
|--------|----------------|--------------------------|-----|-----|-----|--------------------------|-----------------|
| | | I | II | III | IV | Total (T _{io}) | Square Of Total |
| A | y | 8 | 8 | 6 | 8 | 30 | 900 |
| | y ² | 64 | 64 | 36 | 64 | 228 | |
| | | | | | | | |
| B | y | 10 | 8 | 9 | 10 | 37 | 1369 |
| | y ² | 100 | 64 | 81 | 100 | 345 | |
| | | | | | | | |
| C | y | 12 | 10 | 10 | 9 | 41 | 1681 |
| | y ² | 144 | 100 | 100 | 81 | 425 | |
| | | | | | | | |
| | | Total (T _{oj}) | 30 | 26 | 25 | 27 | |
| | | Square Of Total | 900 | 676 | 625 | 729 | |

| Treatments | Blocks | | | | | | Treatments | T_i^2 |
|---------------------------------------|--------|----|-----|-----|------|-----|-----------------|---------|
| Combinations | I | II | III | IV | V | VI | Totals(T_i) | |
| 1 | -3 | 0 | -9 | -12 | -47 | -39 | -110 | 12100 |
| n | 4 | 4 | 7 | 11 | 18 | 38 | 82 | 6724 |
| s | -14 | -3 | -6 | -8 | -23 | -3 | -57 | 3249 |
| ns | 5 | 4 | 6 | 5 | -25 | 5 | 0 | 0 |
| Block Totals(B_i) | -8 | 5 | -2 | -4 | -77 | 1 | G = -85 | |
| B_i^2 | 64 | 25 | 4 | 16 | 5929 | 1 | | |

| Yate's Method For 2^2 Experiment | | | | |
|------------------------------------|---------------------------------|------|------------------------------|-------------------------------|
| Treatment Combination (1) | Total Yield Form All Blocks (2) | (3). | Factorial Effects Totals (4) | SS (5) = (4) ² /4r |
| 1 | -110 | -28 | -85 | 301.041667 |
| n | 82 | -57 | 249 | 2583.375 |
| s | -57 | 192 | -29 | 35.041667 |
| ns | 0 | 57 | -135 | 759.375 |

| ANOVA Table For 2 ² Experiment | | | | | | |
|---|------|------------|------------|-------------------|--------------|--------------|
| Source Of Variation | df | SS | MSS | Variance Ratio(F) | Tabulated 5% | Tabulated 1% |
| Blocks | 5 | 1208.708 | 241.7416 | 1.37277 | 2.9 | 4.556 |
| Treatments | 3 | 3377.792 | 1125.93067 | 6.3938 | 3.2874 | 5.417 |
| N | 1 | 2583.375 | 2583.375 | 14.67 | 4.5431 | 8.683 |
| S | 1 | 35.0416667 | 35.0416667 | 0.19899 | 4.5431 | 8.683 |
| NS | 1 | 759.375 | 759.375 | 4.31225 | 4.5431 | 8.683 |
| Error | 15 | 2641.458 | 176.0972 | | | |
| Totals | 24 | 7207.2583 | 51.1 | 43.2 | | |
| a | 44.7 | 60.3 | 70.2 | 61.2 | | |
| b | 45.3 | 55.8 | 57.3 | 52.1 | | |
| ab | 62.7 | 50.2 | 55.3 | 69.3 | | |
| c | 63.4 | 56.6 | 63.2 | 42.3 | | |
| ac | 45.3 | 52.3 | 59.8 | 38.2 | | |
| bc | 57.6 | 47.7 | 55.2 | 48.3 | | |
| abc | 49.3 | 59.8 | 56.8 | 52.5 | | |

| Taking Deviation y = 49.3 | | | | | | |
|---------------------------|--------|---------|---------|--------|---------------|----------------|
| Treatments | i | ii | iii | iv | Treatments(T) | T ² |
| 1 | 2.1 | -1.9 | -1.8 | 6.1 | 4.5 | 20.25 |
| a | 4.6 | -11 | -20.9 | -11.9 | -39.2 | 1536.64 |
| b | 4 | -6.5 | -8 | -2.8 | -13.3 | 176.89 |
| ab | -13.4 | -0.9 | -6 | -20 | -40.3 | 1624.09 |
| c | -14.1 | -7.3 | -13.9 | 7 | -28.3 | 800.89 |
| ac | 4 | -3 | -10.5 | 11.1 | 1.6 | 2.56 |
| bc | -8.3 | 1.6 | -5.9 | 1 | -11.6 | 134.56 |
| abc | 0 | -10.5 | -7.5 | -3.2 | -21.2 | 449.44 |
| Blocks(B) | -21.1 | -39.5 | -74.5 | -12.7 | -147.8 | 4745.32 |
| B ² | 445.21 | 1560.25 | 5550.25 | 161.29 | | |

exp11

| y | y ² | y | y ² | Grand Total | -147 |
|---------|----------------|-------|----------------|-------------|------------|
| 2.1 | 4.41 | -1.8 | 3.24 | Raw SS | 2552.28 |
| 4.6 | 21.16 | -20.9 | 436.81 | CF | 682.65125 |
| 4 | 16 | -8 | 64 | Total SS | 1869.62875 |
| -13.4 | 179.56 | -6 | 36 | SSB | 281.97375 |
| -14.1 | 198.81 | -13.9 | 193.21 | SST | 503.67875 |
| 4 | 16 | -10.5 | 110.25 | SSE | 1083.97635 |
| -8.3 | 68.89 | -5.9 | 34.81 | | |
| 0 | 0 | -7.5 | 56.25 | | |
| -1.9 | 3.61 | 6.1 | 37.21 | | |
| -11 | 121 | -11.9 | 141.61 | | |
| -6.5 | 42.25 | -2.8 | 7.84 | | |
| -0.9 | 0.81 | -20 | 400 | | |
| -7.3 | 53.29 | 7 | 49 | | |
| -3 | 9 | 11.1 | 123.21 | | |
| 1.6 | 2.56 | 1 | 1 | | |
| -10.5 | 110.25 | -3.2 | 10.24 | | |
| Total | 847.6 | Total | 1704.68 | | |
| 2552.28 | | | | | |

| Source Of Variation | | SS | | | df | | MSS | | F | | Tabulated F | |
|---------------------|-------------|-----------|--|--|----|--|-------------|--|-------------|--|-------------|--|
| | | | | | | | | | | | 5% | |
| Blocks | | 281.97275 | | | 7 | | 40.281821 | | 1.820903595 | | 3.07 | |
| Treatments | | 503.67875 | | | 7 | | 71.95410714 | | 1.393975422 | | 2.49 | |
| Treatment | Total Yield | 79.38 | | | 1 | | 79.38 | | 1.537838121 | | 4.33 | |
| a | | 19.53125 | | | 1 | | 19.53125 | | 0.378381215 | | 4.33 | |
| Combination | | 4.5 | | | 1 | | -88.3 | | 0.314716308 | | 4.33 | |
| I | ab | -39.2 | | | 1 | | -59.5 | | 0.502151223 | | 4.33 | |
| a | c | -13.3 | | | 1 | | -70.2 | | 5.01339974 | | 4.33 | |
| b | ac | -40.3 | | | 1 | | 20.3 | | 0.099190365 | | 4.33 | |
| ab | bc | -28.3 | | | 1 | | -18.9 | | 0.912150981 | | 4.33 | |
| c | abc | 1.6 | | | 21 | | -6.151 | | 6179166791 | | | |
| ac | Error | -11.6 | | | 31 | | 16.7 | | 12.8 | | 5.12 | |
| bc | Total | -21.2 | | | | | -39.5 | | -56.2 | | 98.70125 | |
| abc | | | | | | | | | | | | |