***SPC Exam Practice***

**Question Number – 1:**

Given the data below and using the moving range, what is the upper control limit for the Individual X control chart? Please enter your answer with at least 4 significant digits.

**Answer:** 115.0624174

**Reference: Template.xlsx/SPC/Copy the data to B26 and also check C26 column so that calculations can go till data set end only and take answer from B21 (Clear all the pre-existing data at first)**

|  |
| --- |
| **Observation 1** |
| 93.20193 |
| 95.28538 |
| 103.2274 |
| 107.2807 |
| 103.4194 |
| 101.576 |
| 98.34655 |
| 100.7592 |
| 101.5522 |
| 104.5245 |
| 109.6496 |
| 96.06192 |
| 92.20984 |
| 101.0411 |
| 109.2377 |
| 104.3526 |
| 103.4993 |
| 107.746 |
| 104.5939 |
| 100.1952 |
| 98.88911 |
| 99.13744 |
| 101.7696 |
| 109.5513 |
| 102.2291 |
| 88.65574 |
| 102.4965 |
| 104.5463 |
| 104.7667 |
| 103.7437 |
| 110.8413 |
| 101.4933 |
| 96.15026 |
| 104.2305 |
| 106.0233 |
| 100.636 |
| 108.844 |
| 109.2568 |
| 107.2663 |
| 104.1456 |

**Question Number – 2:**

Given the data below and using the moving range, what is the upper control limit for the Individual X control chart? Please enter your answer with at least 4 significant digits.

**Answer:** 237.878639

**Reference: Template.xlsx/SPC/Copy the data to B26 and also check C26 column so that calculations can go till data set end only and take answer from B21 (Clear all the pre-existing data at first)**

|  |
| --- |
| **Observation 1** |
| 208.0096 |
| 215.0542 |
| 172.1981 |
| 215.3538 |
| 188.1096 |
| 205.5256 |
| 189.1201 |
| 207.6371 |
| 212.3286 |
| 192.7871 |
| 177.4139 |
| 202.0896 |
| 183.9473 |
| 195.0867 |
| 207.3833 |
| 205.2328 |
| 203.3433 |
| 191.0795 |
| 200.1628 |
| 200.1733 |
| 212.4065 |
| 194.521 |
| 208.8303 |
| 198.3401 |
| 214.9981 |
| 193.8405 |
| 188.3636 |
| 182.9819 |
| 201.3272 |
| 180.9417 |
| 209.3462 |
| 200.0447 |
| 215.7843 |
| 203.4826 |
| 207.5185 |
| 192.2158 |
| 211.7607 |
| 206.783 |
| 203.9719 |
| 215.3725 |
| 198.1469 |
| 187.3457 |
| 208.8034 |
| 192.7504 |
| 201.9732 |
| 195.5058 |
| 180.3241 |
| 193.2269 |

**Question Number – 3:**

Given the data below, what is the upper control limit for the Range control chart? Please enter your answer with at least 4 significant digits.

**Answer:** 51.9294919

**Reference: Template.xlsx/SPC/Copy the data to H5 and also check N6 and O6 columns so that calculations can go till data set end only, put 3 (as we have three observation columns) to G8 and take answer from G15 (Clear all the pre-existing data at first)**

|  |  |  |
| --- | --- | --- |
| Observation 1 | Observation 2 | Observation 3 |
| 185.2725 | 200.9982 | 197.0239 |
| 204.9168 | 171.6503 | 210.6306 |
| 196.523 | 180.4912 | 205.8322 |
| 185.0824 | 207.9887 | 194.3331 |
| 183.8339 | 188.2296 | 183.6793 |
| 192.3393 | 199.3 | 201.1925 |
| 180.5695 | 192.4703 | 187.0351 |
| 192.2959 | 191.5856 | 189.5489 |
| 211.2007 | 190.5326 | 176.6895 |
| 183.7754 | 176.6847 | 203.0225 |
| 207.8247 | 209.2915 | 172.3148 |
| 205.9719 | 195.22 | 193.6341 |
| 182.0331 | 188.2439 | 190.8884 |
| 179.1683 | 176.6444 | 198.9898 |
| 207.2684 | 195.873 | 191.1646 |
| 202.957 | 183.9721 | 192.5653 |
| 224.8907 | 210.8691 | 199.3196 |
| 184.1493 | 189.3311 | 166.394 |
| 191.3705 | 191.0416 | 210.3928 |
| 203.3161 | 203.4077 | 206.2014 |
| 190.494 | 177.2144 | 200.7281 |
| 201.592 | 194.8445 | 192.6464 |
| 193.429 | 196.9183 | 181.7151 |
| 208.8042 | 204.2897 | 201.1305 |
| 201.5456 | 194.1967 | 186.7716 |
| 169.8499 | 198.0209 | 195.2055 |
| 207.5891 | 177.1992 | 187.2359 |
| 183.0024 | 195.1759 | 196.2221 |
| 206.3932 | 186.3648 | 194.506 |
| 180.3034 | 210.5168 | 216.3584 |
| 187.1479 | 181.3997 | 203.0031 |
| 182.6643 | 213.2587 | 195.5195 |
| 190.616 | 196.1439 | 181.083 |
| 208.0065 | 171.1563 | 195.3203 |
| 195.2731 | 197.9471 | 178.6637 |
| 187.0732 | 202.755 | 213.7911 |

**Question Number – 4:**

Given the data below and using the average range, what is the upper control limit for the X-bar control chart? Please enter your answer with at least 4 significant digits.

**Answer:** 135.7932224

**Reference: Template.xlsx/SPC/Copy the data to H5 and also check N6 and O6 columns so that calculations can go till data set end only, put 3 (as we have three observation columns) to G8 and take answer from G13 (Clear all the pre-existing data at first)**

|  |  |  |
| --- | --- | --- |
| Observation 1 | Observation 2 | Observation 3 |
| 116.343 | 130.8453 | 130.775 |
| 122.7971 | 133.0061 | 130.6323 |
| 122.0869 | 134.3352 | 132.8172 |
| 133.0598 | 133.3514 | 128.7179 |
| 126.0772 | 131.5365 | 125.6582 |
| 121.0124 | 125.508 | 120.1444 |
| 128.4739 | 129.0497 | 129.6707 |
| 134.0208 | 119.6215 | 128.7576 |
| 124.4625 | 123.6424 | 130.4014 |
| 132.8317 | 129.2947 | 128.375 |
| 122.8497 | 125.9261 | 121.4594 |
| 126.3721 | 130.8328 | 125.5487 |
| 126.6212 | 128.4894 | 117.3693 |
| 133.1636 | 127.2919 | 135.8764 |
| 134.3237 | 136.5567 | 117.6304 |
| 130.3765 | 120.3093 | 131.4003 |
| 131.9508 | 128.517 | 130.4455 |
| 131.1952 | 119.1292 | 130.6483 |
| 127.3329 | 125.014 | 123.9013 |
| 123.4706 | 122.9109 | 125.9084 |
| 129.6594 | 125.5084 | 131.6042 |
| 122.3708 | 120.9575 | 132.091 |
| 125.5318 | 140.3585 | 131.8821 |
| 122.3979 | 121.3708 | 125.0064 |
| 135.7578 | 126.8326 | 120.7475 |
| 123.7474 | 126.417 | 126.3064 |
| 122.4981 | 127.3634 | 122.869 |
| 128.8697 | 124.0946 | 121.9912 |
| 127.5139 | 122.6062 | 135.3492 |
| 111.1674 | 125.4577 | 128.794 |
| 125.18 | 126.2371 | 133.067 |
| 127.8536 | 127.5267 | 118.8395 |
| 121.0874 | 126.0893 | 127.4523 |
| 122.6234 | 134.9239 | 126.3249 |

**Question Number – 5:**

Given the data below and using the average range, what is the lower control limit for the X-bar control chart? Please enter your answer with at least 4 significant digits.

**Answer:** 116.9631548

**Reference: Template.xlsx/SPC/Copy the data to H5 and also check N6 and O6 columns so that calculations can go till data set end only, put 4 (as we have four observation columns) to G8 and take answer from G12 (Clear all the pre-existing data at first)**

|  |  |  |  |
| --- | --- | --- | --- |
| Observation 1 | Observation 2 | Observation 3 | Observation 4 |
| 135.1194 | 121.8528 | 135.232 | 123.9667 |
| 124.8347 | 132.3782 | 129.5573 | 124.5778 |
| 125.8426 | 123.383 | 126.0479 | 127.3226 |
| 116.2704 | 127.6994 | 128.335 | 125.8299 |
| 133.8349 | 124.1097 | 134.9663 | 130.2715 |
| 130.6268 | 124.9622 | 120.7 | 128.0254 |
| 123.5604 | 122.2167 | 138.8074 | 135.9524 |
| 122.5412 | 107.9319 | 129.783 | 132.8441 |
| 126.117 | 129.6241 | 126.8083 | 130.4214 |
| 133.9749 | 118.0418 | 128.5346 | 128.5363 |
| 125.6681 | 129.6132 | 117.5821 | 118.6804 |
| 127.5629 | 117.9426 | 136.1041 | 133.8547 |
| 119.4715 | 127.0524 | 121.4272 | 130.8038 |
| 124.1854 | 123.3601 | 118.9777 | 134.3609 |
| 127.6894 | 141.2286 | 124.4616 | 129.6152 |
| 128.6982 | 131.9477 | 118.4108 | 128.4524 |
| 123.3006 | 137.5361 | 123.322 | 117.2291 |
| 128.6231 | 129.2596 | 119.4783 | 128.6592 |
| 130.2089 | 135.6632 | 122.5543 | 121.6141 |
| 132.6758 | 131.1564 | 129.5676 | 128.2594 |
| 126.0221 | 115.4953 | 128.1251 | 135.1979 |
| 132.2559 | 125.3552 | 125.8271 | 115.9664 |
| 133.9141 | 126.566 | 117.6175 | 128.3384 |
| 132.9856 | 121.8665 | 131.4195 | 124.9172 |
| 116.1693 | 124.0481 | 123.9566 | 127.8431 |
| 132.4865 | 124.1686 | 122.2544 | 128.5099 |
| 119.762 | 123.2341 | 132.8431 | 123.9069 |
| 136.5108 | 120.1145 | 137.7706 | 145.5007 |
| 123.5895 | 119.7708 | 116.7117 | 127.6856 |
| 116.6092 | 136.6738 | 128.8258 | 126.4608 |
| 131.4735 | 126.4301 | 127.892 | 116.5174 |
| 121.8438 | 127.3729 | 133.7614 | 127.549 |
| 121.1593 | 122.3652 | 125.8982 | 118.2933 |
| 128.8223 | 119.236 | 133.4707 | 119.7967 |
| 133.7945 | 135.1619 | 123.3185 | 128.7055 |

**Question Number – 6:**

Given the data below, what is the upper control limit for the Moving Range control chart? Please enter your answer with at least 4 significant digits.

**Answer:** 41.89380763

**Reference: Template.xlsx/SPC/Copy the data to B26 and also check C26 column so that calculations can go till data set end only and take answer from B24 (Clear all the pre-existing data at first)**

|  |
| --- |
| **Observation 1** |
| 101.8373 |
| 91.72389 |
| 105.4251 |
| 71.74863 |
| 97.46886 |
| 97.0736 |
| 63.43427 |
| 82.22744 |
| 96.99808 |
| 89.17505 |
| 71.16826 |
| 110.1444 |
| 97.84052 |
| 101.5826 |
| 89.14564 |
| 83.88583 |
| 91.81943 |
| 83.28547 |
| 90.82308 |
| 69.13755 |
| 101.5517 |
| 82.50717 |
| 93.34381 |
| 97.03417 |
| 90.50835 |
| 98.39689 |
| 93.71459 |
| 93.31951 |
| 91.47923 |
| 99.50492 |
| 88.51225 |
| 89.44343 |
| 100.2407 |
| 99.3778 |
| 84.42156 |
| 112.0154 |
| 104.3791 |
| 94.07892 |

**Question Number – 7:**

Given.

**Answer:** 0

**Reference: Template.xlsx/SPC/E8**