

## DAFTAR PUSTAKA

- Antono, I., Santoso, R., & Wilandari, Y. (2016). Komputasi Metode *Exponentially Weighted Moving Average* Untuk Pengendalian Kualitas Proses Produksi Menggunakan GUI Matlab. *Jurnal Gaussian*, Volume 5 Nomor 4, ISSN: 2339-2541.
- AP, A. (2017). Analisis Keakuratan Peta Kendali Modifikasi *Exponentially Weighted Moving Average Control Chart*. *Asian Journal of Management Research*, ISSN 2229-3795.
- Ariani, & Wahyu, D. (2004). *Pengendalian Kualitas Statistik (Pendekatan Kuantitatif dalam Manajemen Kualitas)*. Yogyakarta: ANDI Yogyakarta.
- Arnold, P. W., Nainggolan, P., & Damanik, D. (2020). Analisis Kelayakan Usaha dan Strategi Pengembangan Industri Kecil Tempe di Kelurahan Setia Negara Kecamatan Siantar Sitalasari. *Jurnal Ekuilnomi*, 29-39.
- Chan, L., Lin, D., Xie, M., & Goh, T. (2002). Cumulative Probability Control Chart for Geometric and Exponential Process Characteristics. *International Journal of Production Research*, 14, 133-150.
- Dewiantari, N., Sumarjaya, I., & Gandhiadi, G. (2019). Peta Kendali EWMA Residual pada Data Berautokorelasi. *E-Jurnal Matematika*, Vol. 8 No. 1, 64-73.
- Dhiyaulhaq, & Yuniar. (2021). Usulan Perbaikan Kualitas Produk Sweater Rajut Menggunakan Metode Seven Tools di Konveksi Maman Collection. *Prosiding Diseminasi FTI Genap*, 3.
- Diana, (2017). Distribusi Binomial sebagai Estimasi Probabilitas Kesuksesan pada Uji Coba Kualitas Layanan Sistem Informasi. *Jurnal Ilmiah Matriks*, 19(3), 227-236.
- Gasperz, V. 2005. *Total Quality Manajemen*. Jakarta: Gramedia Pustaka Utama.
- Kalgonda, A.A. Kosthi, V.V. and Ashokan, K.V. 2010. *Exponentially Weighted Moving Average Control Chart*. *Asian Journal of Management Research*. ISSN 2229-3795.
- Mitra, A. 2008. *Fundamentals of Quality Control and Improvement 3rd Edition*. Alabama: Auburn.

- Montgomery, D. (1990). *Pengantar Pengendalian Kualitas Statistik*. Yogyakarta: Universitas Gajah Mada.
- Montgomery, D. (2005). *Introduction to Statistical Quality Control Fifth Edition*. New York: John Wiley & Sons, Inc.
- Montgomery, D. (2009). *Introduction to Statistical Quality Control. 6th edition*. New York: Jhon Wiley and Sons.
- Patel, A., & Divecha, J. (2011). Modified exponentially weighted moving average (EWMA) control chart for an analytical process data. *Journal of Chemical Engineering and Materials Science Vol. 2(1)*, 12-20.
- Rahma, E. (2017). *Modifikasi Metode Newton-Steffensen menggunakan Deret Taylor*. Riau, Pekanbaru: Universitas Islam Negeri Sultan Syarif Kasim Riau.
- Sukparungsee, S. (2014). An EWMA p Chart Based On Improved Square Root Transformation. *International Journal of Mathematical, Computational, Physical, Electrical, and Computer Engineering*, Vol. 8 No.7.
- Tsai, T., Lin, C., & Wu, S. (2006). Alternative Attribute Control Charts Based On Improved Square Root Transformation. *Tamsui Oxford Journal of Mathematical Sciences*, Voll. 22 No. 1, 61-72.
- Wijayanti, D. T., Helmi, & Imro'ah, N. (2020). Perbandingan Kinerja Peta Kendali Cumulative Sum dan Peta Kendali Exponentially Weighted Moving Average. *Buletin Ilmiah Mat. Stat. Dan Terapannya (Bimaster)*, Volume 09, No.4, hal 549-558.

# LAMPIRAN

**Lampiran 1.** Data hasil produksi sweater rajut di Konveksi Maman *Collection* dalam 31 hari kerja periode 1 Oktober 2020 sampai dengan 6 November 2020

| N<br>O | Tanggal    | Jumlah<br>Produksi | Kriteria Cacat            |                          |                                  |                | Jumlah<br>Produk<br>Cacat |
|--------|------------|--------------------|---------------------------|--------------------------|----------------------------------|----------------|---------------------------|
|        |            |                    | Ukuran<br>Tidak<br>Sesuai | Jahitan<br>Tidak<br>Rapi | Belum<br>Terjahit<br>(Berlubang) | Sisa<br>Benang |                           |
| 1      | 1/10/2020  | 1152               | 6                         | 2                        | 5                                | 2              | 15                        |
| 2      | 2/10/2020  | 936                | 2                         | 3                        | 5                                | 2              | 12                        |
| 3      | 4/10/2020  | 984                | 2                         | 2                        | 7                                | 2              | 13                        |
| 4      | 5/10/2020  | 912                | 3                         | 5                        | 7                                | 0              | 15                        |
| 5      | 6/10/2020  | 768                | 4                         | 5                        | 5                                | 0              | 14                        |
| 6      | 8/10/2020  | 780                | 3                         | 2                        | 5                                | 5              | 15                        |
| 7      | 9/10/2020  | 948                | 2                         | 6                        | 0                                | 4              | 12                        |
| 8      | 11/10/2020 | 1056               | 7                         | 0                        | 8                                | 0              | 15                        |
| 9      | 12/10/2020 | 612                | 5                         | 0                        | 6                                | 0              | 11                        |
| 10     | 13/10/2020 | 672                | 2                         | 0                        | 6                                | 2              | 10                        |
| 11     | 14/10/2020 | 876                | 5                         | 0                        | 5                                | 5              | 15                        |
| 12     | 15/10/2020 | 996                | 3                         | 0                        | 6                                | 5              | 14                        |
| 13     | 16/10/2020 | 744                | 5                         | 2                        | 5                                | 7              | 19                        |
| 14     | 18/10/2020 | 612                | 0                         | 0                        | 5                                | 0              | 5                         |
| 15     | 19/10/2020 | 768                | 3                         | 6                        | 5                                | 0              | 14                        |
| 16     | 20/10/2020 | 756                | 3                         | 3                        | 5                                | 0              | 11                        |
| 17     | 21/10/2020 | 780                | 2                         | 7                        | 7                                | 0              | 16                        |
| 18     | 22/10/2020 | 756                | 5                         | 2                        | 5                                | 0              | 12                        |
| 19     | 23/10/2020 | 684                | 3                         | 2                        | 6                                | 0              | 11                        |
| 20     | 25/10/2020 | 672                | 5                         | 0                        | 6                                | 0              | 11                        |
| 21     | 26/10/2020 | 720                | 3                         | 0                        | 7                                | 0              | 10                        |
| 22     | 27/10/2020 | 984                | 5                         | 0                        | 7                                | 0              | 12                        |
| 23     | 28/10/2020 | 564                | 0                         | 0                        | 5                                | 0              | 5                         |
| 24     | 29/10/2020 | 792                | 5                         | 0                        | 6                                | 0              | 11                        |
| 25     | 30/10/2020 | 912                | 8                         | 0                        | 7                                | 0              | 15                        |
| 26     | 01/11/2020 | 768                | 2                         | 6                        | 5                                | 2              | 15                        |
| 27     | 2/11/2020  | 972                | 3                         | 3                        | 5                                | 2              | 13                        |
| 28     | 3/11/2020  | 876                | 3                         | 3                        | 6                                | 0              | 12                        |
| 29     | 4/11/2020  | 624                | 2                         | 7                        | 7                                | 5              | 21                        |
| 30     | 5/11/2020  | 720                | 2                         | 2                        | 7                                | 0              | 11                        |
| 31     | 6/11/2020  | 984                | 3                         | 5                        | 5                                | 2              | 15                        |

## Lampiran 2. Hasil uji kecocokan distribusi

```
Asymptotic one-sample Kolmogorov-Smirnov test  
data: x  
D = 0.5, p-value = 0.27  
alternative hypothesis: two-sided
```

**Lampiran 3.** Nilai  $Z_i$  pada masing-masing  $\lambda$

| i  | Tanggal    | Jumlah<br>Produk<br>Cacat | $\lambda$ |         |         |         |         |         |         |
|----|------------|---------------------------|-----------|---------|---------|---------|---------|---------|---------|
|    |            |                           | 0.01      | 0.02    | 0.1     | 0.2     | 0.3     | 0.6     | 0.9     |
| 1  | 1/10/2020  | 15                        | 0.01573   | 0.01571 | 0.01549 | 0.01521 | 0.01494 | 0.01412 | 0.01329 |
| 2  | 2/10/2020  | 12                        | 0.01570   | 0.01565 | 0.01522 | 0.01473 | 0.01430 | 0.01334 | 0.01287 |
| 3  | 4/10/2020  | 13                        | 0.01568   | 0.01560 | 0.01502 | 0.01443 | 0.01398 | 0.01326 | 0.01318 |
| 4  | 5/10/2020  | 15                        | 0.01569   | 0.01562 | 0.01516 | 0.01483 | 0.01472 | 0.01517 | 0.01612 |
| 5  | 6/10/2020  | 14                        | 0.01571   | 0.01567 | 0.01547 | 0.01551 | 0.01577 | 0.01701 | 0.01802 |
| 6  | 8/10/2020  | 15                        | 0.01575   | 0.01574 | 0.01584 | 0.01626 | 0.01681 | 0.01834 | 0.01911 |
| 7  | 9/10/2020  | 12                        | 0.01572   | 0.01568 | 0.01553 | 0.01554 | 0.01556 | 0.01493 | 0.01330 |
| 8  | 11/10/2020 | 15                        | 0.01570   | 0.01565 | 0.01539 | 0.01527 | 0.01516 | 0.01450 | 0.01411 |
| 9  | 12/10/2020 | 11                        | 0.01572   | 0.01570 | 0.01565 | 0.01581 | 0.01600 | 0.01658 | 0.01759 |
| 10 | 13/10/2020 | 10                        | 0.01572   | 0.01568 | 0.01557 | 0.01562 | 0.01567 | 0.01556 | 0.01515 |
| 11 | 14/10/2020 | 15                        | 0.01573   | 0.01571 | 0.01573 | 0.01592 | 0.01610 | 0.01650 | 0.01693 |
| 12 | 15/10/2020 | 14                        | 0.01571   | 0.01567 | 0.01556 | 0.01555 | 0.01549 | 0.01503 | 0.01434 |
| 13 | 16/10/2020 | 19                        | 0.01581   | 0.01587 | 0.01656 | 0.01755 | 0.01850 | 0.02134 | 0.02442 |
| 14 | 18/10/2020 | 5                         | 0.01573   | 0.01572 | 0.01572 | 0.01567 | 0.01540 | 0.01344 | 0.00979 |
| 15 | 19/10/2020 | 14                        | 0.01576   | 0.01577 | 0.01597 | 0.01618 | 0.01625 | 0.01631 | 0.01739 |
| 16 | 20/10/2020 | 11                        | 0.01575   | 0.01574 | 0.01583 | 0.01586 | 0.01574 | 0.01525 | 0.01483 |
| 17 | 21/10/2020 | 16                        | 0.01580   | 0.01584 | 0.01630 | 0.01679 | 0.01717 | 0.01841 | 0.01994 |
| 18 | 22/10/2020 | 12                        | 0.01580   | 0.01584 | 0.01626 | 0.01661 | 0.01678 | 0.01689 | 0.01628 |
| 19 | 23/10/2020 | 11                        | 0.01580   | 0.01584 | 0.01624 | 0.01650 | 0.01657 | 0.01640 | 0.01610 |
| 20 | 25/10/2020 | 11                        | 0.01580   | 0.01586 | 0.01625 | 0.01647 | 0.01651 | 0.01638 | 0.01634 |
| 21 | 26/10/2020 | 10                        | 0.01579   | 0.01582 | 0.01601 | 0.01596 | 0.01572 | 0.01489 | 0.01413 |
| 22 | 27/10/2020 | 12                        | 0.01575   | 0.01574 | 0.01563 | 0.01520 | 0.01467 | 0.01327 | 0.01239 |
| 23 | 28/10/2020 | 5                         | 0.01568   | 0.01561 | 0.01496 | 0.01394 | 0.01293 | 0.01063 | 0.00922 |
| 24 | 29/10/2020 | 11                        | 0.01566   | 0.01557 | 0.01485 | 0.01393 | 0.01321 | 0.01258 | 0.01342 |
| 25 | 30/10/2020 | 15                        | 0.01567   | 0.01559 | 0.01501 | 0.01443 | 0.01418 | 0.01490 | 0.01614 |
| 26 | 01/11/2020 | 15                        | 0.01571   | 0.01567 | 0.01546 | 0.01545 | 0.01579 | 0.01768 | 0.01919 |
| 27 | 2/11/2020  | 13                        | 0.01569   | 0.01562 | 0.01525 | 0.01504 | 0.01506 | 0.01510 | 0.01396 |
| 28 | 3/11/2020  | 12                        | 0.01567   | 0.01558 | 0.01510 | 0.01477 | 0.01465 | 0.01426 | 0.01372 |
| 29 | 4/11/2020  | 21                        | 0.01585   | 0.01594 | 0.01695 | 0.01855 | 0.02035 | 0.02590 | 0.03166 |
| 30 | 5/11/2020  | 11                        | 0.01584   | 0.01593 | 0.01679 | 0.01789 | 0.01883 | 0.01952 | 0.01692 |
| 31 | 6/11/2020  | 15                        | 0.01583   | 0.01592 | 0.01663 | 0.01736 | 0.01776 | 0.01696 | 0.01541 |

**Lampiran 4.** Nilai  $\sigma_{\hat{p}}$

| i  | $\sigma_{\hat{p}}$ |
|----|--------------------|
| 1  | 0.00367            |
| 2  | 0.00407            |
| 3  | 0.00397            |
| 4  | 0.00412            |
| 5  | 0.00449            |
| 6  | 0.00446            |
| 7  | 0.00405            |
| 8  | 0.00383            |
| 9  | 0.00503            |
| 10 | 0.00480            |
| 11 | 0.00421            |
| 12 | 0.00395            |
| 13 | 0.00457            |
| 14 | 0.00503            |
| 15 | 0.00449            |
| 16 | 0.00453            |
| 17 | 0.00446            |
| 18 | 0.00453            |
| 19 | 0.00476            |
| 20 | 0.00480            |
| 21 | 0.00464            |
| 22 | 0.00397            |
| 23 | 0.00524            |
| 24 | 0.00443            |
| 25 | 0.00412            |
| 26 | 0.00449            |
| 27 | 0.00399            |
| 28 | 0.00421            |
| 29 | 0.00499            |
| 30 | 0.00464            |
| 31 | 0.00397            |

**Lampiran 5.** Nilai *Central Line (CL)*, *Upper Control Limit (UCL)* dan *Lower Control Limit (LCL)* peta kendali *p*

| i  | Pi        | CL        | UCL       | LCL       |
|----|-----------|-----------|-----------|-----------|
| 1  | 0.0130208 | 0.0157604 | 0.0267690 | 0.0047519 |
| 2  | 0.0128205 | 0.0157604 | 0.0279733 | 0.0035476 |
| 3  | 0.0132114 | 0.0157604 | 0.0276717 | 0.0038492 |
| 4  | 0.0164474 | 0.0157604 | 0.0281330 | 0.0033879 |
| 5  | 0.0182292 | 0.0157604 | 0.0292431 | 0.0022778 |
| 6  | 0.0192308 | 0.0157604 | 0.0291390 | 0.0023819 |
| 7  | 0.0126582 | 0.0157604 | 0.0278958 | 0.0036251 |
| 8  | 0.0142045 | 0.0157604 | 0.0272585 | 0.0042624 |
| 9  | 0.0179739 | 0.0157604 | 0.0308640 | 0.0006569 |
| 10 | 0.0148810 | 0.0157604 | 0.0301740 | 0.0013469 |
| 11 | 0.0171233 | 0.0157604 | 0.0283846 | 0.0031362 |
| 12 | 0.0140562 | 0.0157604 | 0.0275997 | 0.0039211 |
| 13 | 0.0255376 | 0.0157604 | 0.0294588 | 0.0020621 |
| 14 | 0.0081699 | 0.0157604 | 0.0308640 | 0.0006569 |
| 15 | 0.0182292 | 0.0157604 | 0.0292431 | 0.0022778 |
| 16 | 0.0145503 | 0.0157604 | 0.0293497 | 0.0021712 |
| 17 | 0.0205128 | 0.0157604 | 0.0291390 | 0.0023819 |
| 18 | 0.0158730 | 0.0157604 | 0.0293497 | 0.0021712 |
| 19 | 0.0160819 | 0.0157604 | 0.0300470 | 0.0014739 |
| 20 | 0.0163690 | 0.0157604 | 0.0301740 | 0.0013469 |
| 21 | 0.0138889 | 0.0157604 | 0.0296853 | 0.0018356 |
| 22 | 0.0121951 | 0.0157604 | 0.0276717 | 0.0038492 |
| 23 | 0.0088652 | 0.0157604 | 0.0314936 | 0.0000273 |
| 24 | 0.0138889 | 0.0157604 | 0.0290372 | 0.0024836 |
| 25 | 0.0164474 | 0.0157604 | 0.0281330 | 0.0033879 |
| 26 | 0.0195313 | 0.0157604 | 0.0292431 | 0.0022778 |
| 27 | 0.0133745 | 0.0157604 | 0.0277450 | 0.0037759 |
| 28 | 0.0136986 | 0.0157604 | 0.0283846 | 0.0031362 |
| 29 | 0.0336538 | 0.0157604 | 0.0307181 | 0.0008028 |
| 30 | 0.0152778 | 0.0157604 | 0.0296853 | 0.0018356 |
| 31 | 0.0152439 | 0.0157604 | 0.0276717 | 0.0038492 |

**Lampiran 6.** Nilai *Central Line (CL)*, *Upper Control Limit (UCL)* dan *Lower Control Limit (LCL)* peta kendali ISRT binomial EWMA untuk  $\lambda = 0.01$ .

| Zi       | CL      | UCL      | LCL      | Keterangan            |
|----------|---------|----------|----------|-----------------------|
| 0.015733 | 0.01576 | 0.015765 | 0.015757 | <i>In Control</i>     |
| 0.015704 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015679 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015687 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015712 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015747 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015716 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015701 | 0.01576 | 0.015765 | 0.015757 | <i>In Control</i>     |
| 0.015724 | 0.01576 | 0.015766 | 0.015756 | <i>In Control</i>     |
| 0.015716 | 0.01576 | 0.015766 | 0.015756 | <i>In Control</i>     |
| 0.01573  | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015713 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015811 | 0.01576 | 0.015766 | 0.015756 | <i>In Control</i>     |
| 0.015735 | 0.01576 | 0.015766 | 0.015756 | <i>In Control</i>     |
| 0.01576  | 0.01576 | 0.015765 | 0.015756 | <i>Out Of Control</i> |
| 0.015748 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015795 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015796 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015799 | 0.01576 | 0.015766 | 0.015756 | <i>In Control</i>     |
| 0.015805 | 0.01576 | 0.015766 | 0.015756 | <i>In Control</i>     |
| 0.015785 | 0.01576 | 0.015766 | 0.015756 | <i>In Control</i>     |
| 0.01575  | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015681 | 0.01576 | 0.015766 | 0.015755 | <i>In Control</i>     |
| 0.015663 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015671 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015709 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015686 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015666 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |
| 0.015846 | 0.01576 | 0.015766 | 0.015756 | <i>In Control</i>     |
| 0.01584  | 0.01576 | 0.015766 | 0.015756 | <i>In Control</i>     |
| 0.015834 | 0.01576 | 0.015765 | 0.015756 | <i>In Control</i>     |

**Lampiran 7.** Nilai *Central Line (CL)*, *Upper Control Limit (UCL)* dan *Lower Control Limit (LCL)* peta kendali ISRT binomial EWMA untuk  $\lambda = 0.02$ .

| Zi       | CL      | UCL      | LCL      | Keterangan            |
|----------|---------|----------|----------|-----------------------|
| 0.015706 | 0.01576 | 0.015778 | 0.015744 | <i>In Control</i>     |
| 0.015648 | 0.01576 | 0.015779 | 0.015742 | <i>In Control</i>     |
| 0.015599 | 0.01576 | 0.015779 | 0.015743 | <i>In Control</i>     |
| 0.015616 | 0.01576 | 0.01578  | 0.015742 | <i>In Control</i>     |
| 0.015668 | 0.01576 | 0.015781 | 0.015741 | <i>In Control</i>     |
| 0.01574  | 0.01576 | 0.015781 | 0.015741 | <i>In Control</i>     |
| 0.015678 | 0.01576 | 0.015779 | 0.015742 | <i>In Control</i>     |
| 0.015649 | 0.01576 | 0.015778 | 0.015743 | <i>In Control</i>     |
| 0.015695 | 0.01576 | 0.015784 | 0.015738 | <i>In Control</i>     |
| 0.015679 | 0.01576 | 0.015783 | 0.015739 | <i>In Control</i>     |
| 0.015708 | 0.01576 | 0.01578  | 0.015742 | <i>In Control</i>     |
| 0.015675 | 0.01576 | 0.015779 | 0.015743 | <i>In Control</i>     |
| 0.015872 | 0.01576 | 0.015782 | 0.01574  | <i>In Control</i>     |
| 0.015718 | 0.01576 | 0.015784 | 0.015738 | <i>In Control</i>     |
| 0.015768 | 0.01576 | 0.015781 | 0.015741 | <i>Out Of Control</i> |
| 0.015744 | 0.01576 | 0.015781 | 0.01574  | <i>Out Of Control</i> |
| 0.015839 | 0.01576 | 0.015781 | 0.015741 | <i>In Control</i>     |
| 0.01584  | 0.01576 | 0.015781 | 0.01574  | <i>In Control</i>     |
| 0.015845 | 0.01576 | 0.015783 | 0.01574  | <i>In Control</i>     |
| 0.015855 | 0.01576 | 0.015783 | 0.015739 | <i>In Control</i>     |
| 0.015816 | 0.01576 | 0.015782 | 0.01574  | <i>In Control</i>     |
| 0.015743 | 0.01576 | 0.015779 | 0.015743 | <i>Out Of Control</i> |
| 0.015606 | 0.01576 | 0.015785 | 0.015738 | <i>In Control</i>     |
| 0.015572 | 0.01576 | 0.015781 | 0.015741 | <i>In Control</i>     |
| 0.015589 | 0.01576 | 0.01578  | 0.015742 | <i>In Control</i>     |
| 0.015668 | 0.01576 | 0.015781 | 0.015741 | <i>In Control</i>     |
| 0.015622 | 0.01576 | 0.015779 | 0.015743 | <i>In Control</i>     |
| 0.015584 | 0.01576 | 0.01578  | 0.015742 | <i>In Control</i>     |
| 0.015945 | 0.01576 | 0.015783 | 0.015739 | <i>In Control</i>     |
| 0.015932 | 0.01576 | 0.015782 | 0.01574  | <i>In Control</i>     |
| 0.015918 | 0.01576 | 0.015779 | 0.015743 | <i>In Control</i>     |

**Lampiran 8.** Nilai *Central Line (CL)*, *Upper Control Limit (UCL)* dan *Lower Control Limit (LCL)* peta kendali ISRT binomial EWMA untuk  $\lambda = 0.1$ .

| Zi       | CL      | UCL      | LCL      | Keterangan            |
|----------|---------|----------|----------|-----------------------|
| 0.015486 | 0.01576 | 0.016219 | 0.015306 | <i>Out Of Control</i> |
| 0.01522  | 0.01576 | 0.016269 | 0.015257 | <i>In Control</i>     |
| 0.015019 | 0.01576 | 0.016256 | 0.015269 | <i>In Control</i>     |
| 0.015162 | 0.01576 | 0.016275 | 0.01525  | <i>In Control</i>     |
| 0.015469 | 0.01576 | 0.016321 | 0.015205 | <i>Out Of Control</i> |
| 0.015845 | 0.01576 | 0.016317 | 0.015209 | <i>Out Of Control</i> |
| 0.015526 | 0.01576 | 0.016265 | 0.01526  | <i>Out Of Control</i> |
| 0.015394 | 0.01576 | 0.016239 | 0.015286 | <i>Out Of Control</i> |
| 0.015652 | 0.01576 | 0.016388 | 0.01514  | <i>Out Of Control</i> |
| 0.015575 | 0.01576 | 0.016359 | 0.015167 | <i>Out Of Control</i> |
| 0.01573  | 0.01576 | 0.016286 | 0.01524  | <i>Out Of Control</i> |
| 0.015562 | 0.01576 | 0.016253 | 0.015272 | <i>Out Of Control</i> |
| 0.01656  | 0.01576 | 0.01633  | 0.015196 | <i>In Control</i>     |
| 0.015721 | 0.01576 | 0.016388 | 0.01514  | <i>Out Of Control</i> |
| 0.015972 | 0.01576 | 0.016321 | 0.015205 | <i>Out Of Control</i> |
| 0.01583  | 0.01576 | 0.016325 | 0.015201 | <i>Out Of Control</i> |
| 0.016298 | 0.01576 | 0.016317 | 0.015209 | <i>Out Of Control</i> |
| 0.016255 | 0.01576 | 0.016325 | 0.015201 | <i>Out Of Control</i> |
| 0.016238 | 0.01576 | 0.016354 | 0.015173 | <i>Out Of Control</i> |
| 0.016251 | 0.01576 | 0.016359 | 0.015167 | <i>Out Of Control</i> |
| 0.016015 | 0.01576 | 0.016339 | 0.015187 | <i>Out Of Control</i> |
| 0.015633 | 0.01576 | 0.016256 | 0.015269 | <i>Out Of Control</i> |
| 0.014956 | 0.01576 | 0.016414 | 0.015114 | <i>In Control</i>     |
| 0.014849 | 0.01576 | 0.016313 | 0.015213 | <i>In Control</i>     |
| 0.015009 | 0.01576 | 0.016275 | 0.01525  | <i>In Control</i>     |
| 0.015461 | 0.01576 | 0.016321 | 0.015205 | <i>Out Of Control</i> |
| 0.015253 | 0.01576 | 0.016259 | 0.015266 | <i>In Control</i>     |
| 0.015097 | 0.01576 | 0.016286 | 0.01524  | <i>In Control</i>     |
| 0.016953 | 0.01576 | 0.016382 | 0.015145 | <i>In Control</i>     |
| 0.016785 | 0.01576 | 0.016339 | 0.015187 | <i>In Control</i>     |
| 0.016631 | 0.01576 | 0.016256 | 0.015269 | <i>In Control</i>     |

**Lampiran 9.** Nilai *Central Line (CL)*, *Upper Control Limit (UCL)* dan *Lower Control Limit (LCL)* peta kendali ISRT binomial EWMA untuk  $\lambda = 0.2$ .

| Zi       | CL      | UCL      | LCL      | Keterangan            |
|----------|---------|----------|----------|-----------------------|
| 0.015213 | 0.01576 | 0.017702 | 0.013826 | <i>Out Of Control</i> |
| 0.014734 | 0.01576 | 0.017913 | 0.013617 | <i>Out Of Control</i> |
| 0.01443  | 0.01576 | 0.017861 | 0.013669 | <i>Out Of Control</i> |
| 0.014833 | 0.01576 | 0.017942 | 0.013589 | <i>Out Of Control</i> |
| 0.015512 | 0.01576 | 0.018137 | 0.013396 | <i>Out Of Control</i> |
| 0.016256 | 0.01576 | 0.018118 | 0.013414 | <i>Out Of Control</i> |
| 0.015536 | 0.01576 | 0.0179   | 0.01363  | <i>Out Of Control</i> |
| 0.01527  | 0.01576 | 0.017788 | 0.013741 | <i>Out Of Control</i> |
| 0.015811 | 0.01576 | 0.018421 | 0.013114 | <i>Out Of Control</i> |
| 0.015625 | 0.01576 | 0.0183   | 0.013234 | <i>Out Of Control</i> |
| 0.015925 | 0.01576 | 0.017986 | 0.013545 | <i>Out Of Control</i> |
| 0.015551 | 0.01576 | 0.017848 | 0.013682 | <i>Out Of Control</i> |
| 0.017548 | 0.01576 | 0.018174 | 0.013358 | <i>Out Of Control</i> |
| 0.015673 | 0.01576 | 0.018421 | 0.013114 | <i>Out Of Control</i> |
| 0.016184 | 0.01576 | 0.018137 | 0.013396 | <i>Out Of Control</i> |
| 0.015857 | 0.01576 | 0.018155 | 0.013377 | <i>Out Of Control</i> |
| 0.016788 | 0.01576 | 0.018118 | 0.013414 | <i>Out Of Control</i> |
| 0.016605 | 0.01576 | 0.018155 | 0.013377 | <i>Out Of Control</i> |
| 0.016501 | 0.01576 | 0.018278 | 0.013256 | <i>Out Of Control</i> |
| 0.016474 | 0.01576 | 0.0183   | 0.013234 | <i>Out Of Control</i> |
| 0.015957 | 0.01576 | 0.018214 | 0.013319 | <i>Out Of Control</i> |
| 0.015205 | 0.01576 | 0.017861 | 0.013669 | <i>Out Of Control</i> |
| 0.013937 | 0.01576 | 0.018531 | 0.013005 | <i>Out Of Control</i> |
| 0.013927 | 0.01576 | 0.0181   | 0.013431 | <i>Out Of Control</i> |
| 0.014431 | 0.01576 | 0.017942 | 0.013589 | <i>Out Of Control</i> |
| 0.015451 | 0.01576 | 0.018137 | 0.013396 | <i>Out Of Control</i> |
| 0.015036 | 0.01576 | 0.017873 | 0.013656 | <i>Out Of Control</i> |
| 0.014768 | 0.01576 | 0.017986 | 0.013545 | <i>Out Of Control</i> |
| 0.018546 | 0.01576 | 0.018395 | 0.013139 | <i>In Control</i>     |
| 0.017892 | 0.01576 | 0.018214 | 0.013319 | <i>Out Of Control</i> |
| 0.017362 | 0.01576 | 0.017861 | 0.013669 | <i>Out Of Control</i> |

**Lampiran 10.** Nilai *Central Line (CL)*, *Upper Control Limit (UCL)* dan *Lower Control Limit (LCL)* peta kendali ISRT binomial EWMA untuk  $\lambda = 0.3$ .

| Zi       | CL      | UCL      | LCL      | Keterangan            |
|----------|---------|----------|----------|-----------------------|
| 0.014939 | 0.01576 | 0.02039  | 0.011142 | <i>Out Of Control</i> |
| 0.014303 | 0.01576 | 0.020896 | 0.01064  | <i>Out Of Control</i> |
| 0.013976 | 0.01576 | 0.020769 | 0.010766 | <i>Out Of Control</i> |
| 0.014717 | 0.01576 | 0.020963 | 0.010573 | <i>Out Of Control</i> |
| 0.015771 | 0.01576 | 0.021428 | 0.01011  | <i>Out Of Control</i> |
| 0.016809 | 0.01576 | 0.021385 | 0.010154 | <i>Out Of Control</i> |
| 0.015564 | 0.01576 | 0.020863 | 0.010672 | <i>Out Of Control</i> |
| 0.015156 | 0.01576 | 0.020596 | 0.010938 | <i>Out Of Control</i> |
| 0.016001 | 0.01576 | 0.022108 | 0.009435 | <i>Out Of Control</i> |
| 0.015665 | 0.01576 | 0.021818 | 0.009723 | <i>Out Of Control</i> |
| 0.016103 | 0.01576 | 0.021068 | 0.010468 | <i>Out Of Control</i> |
| 0.015489 | 0.01576 | 0.020739 | 0.010796 | <i>Out Of Control</i> |
| 0.018503 | 0.01576 | 0.021519 | 0.010021 | <i>Out Of Control</i> |
| 0.015403 | 0.01576 | 0.022108 | 0.009435 | <i>Out Of Control</i> |
| 0.016251 | 0.01576 | 0.021428 | 0.01011  | <i>Out Of Control</i> |
| 0.015741 | 0.01576 | 0.021473 | 0.010066 | <i>Out Of Control</i> |
| 0.017172 | 0.01576 | 0.021385 | 0.010154 | <i>Out Of Control</i> |
| 0.016783 | 0.01576 | 0.021473 | 0.010066 | <i>Out Of Control</i> |
| 0.016572 | 0.01576 | 0.021765 | 0.009776 | <i>Out Of Control</i> |
| 0.016511 | 0.01576 | 0.021818 | 0.009723 | <i>Out Of Control</i> |
| 0.015725 | 0.01576 | 0.021614 | 0.009926 | <i>Out Of Control</i> |
| 0.014666 | 0.01576 | 0.020769 | 0.010766 | <i>Out Of Control</i> |
| 0.012926 | 0.01576 | 0.022371 | 0.009174 | <i>Out Of Control</i> |
| 0.013215 | 0.01576 | 0.021342 | 0.010196 | <i>Out Of Control</i> |
| 0.014184 | 0.01576 | 0.020963 | 0.010573 | <i>Out Of Control</i> |
| 0.015788 | 0.01576 | 0.021428 | 0.01011  | <i>Out Of Control</i> |
| 0.015064 | 0.01576 | 0.0208   | 0.010735 | <i>Out Of Control</i> |
| 0.014655 | 0.01576 | 0.021068 | 0.010468 | <i>Out Of Control</i> |
| 0.020354 | 0.01576 | 0.022047 | 0.009496 | <i>Out Of Control</i> |
| 0.018831 | 0.01576 | 0.021614 | 0.009926 | <i>Out Of Control</i> |
| 0.017755 | 0.01576 | 0.020769 | 0.010766 | <i>Out Of Control</i> |

**Lampiran 11.** Nilai *Central Line (CL)*, *Upper Control Limit (UCL)* dan *Lower Control Limit (LCL)* peta kendali ISRT binomial EWMA untuk  $\lambda = 0.6$ .

| Zi       | CL      | UCL      | LCL      | Keterangan            |
|----------|---------|----------|----------|-----------------------|
| 0.014117 | 0.01576 | 0.038271 | -0.00672 | <i>Out Of Control</i> |
| 0.013339 | 0.01576 | 0.040731 | -0.00917 | <i>Out Of Control</i> |
| 0.013262 | 0.01576 | 0.040115 | -0.00856 | <i>Out Of Control</i> |
| 0.015173 | 0.01576 | 0.041057 | -0.0095  | <i>Out Of Control</i> |
| 0.017007 | 0.01576 | 0.043324 | -0.01176 | <i>Out Of Control</i> |
| 0.018341 | 0.01576 | 0.043111 | -0.01155 | <i>Out Of Control</i> |
| 0.014931 | 0.01576 | 0.040573 | -0.00902 | <i>Out Of Control</i> |
| 0.014495 | 0.01576 | 0.039271 | -0.00772 | <i>Out Of Control</i> |
| 0.016582 | 0.01576 | 0.046633 | -0.01506 | <i>Out Of Control</i> |
| 0.015562 | 0.01576 | 0.045224 | -0.01365 | <i>Out Of Control</i> |
| 0.016499 | 0.01576 | 0.041571 | -0.01001 | <i>Out Of Control</i> |
| 0.015033 | 0.01576 | 0.039968 | -0.00841 | <i>Out Of Control</i> |
| 0.021336 | 0.01576 | 0.043764 | -0.0122  | <i>Out Of Control</i> |
| 0.013436 | 0.01576 | 0.046633 | -0.01506 | <i>Out Of Control</i> |
| 0.016312 | 0.01576 | 0.043324 | -0.01176 | <i>Out Of Control</i> |
| 0.015255 | 0.01576 | 0.043542 | -0.01198 | <i>Out Of Control</i> |
| 0.01841  | 0.01576 | 0.043111 | -0.01155 | <i>Out Of Control</i> |
| 0.016888 | 0.01576 | 0.043542 | -0.01198 | <i>Out Of Control</i> |
| 0.016404 | 0.01576 | 0.044965 | -0.0134  | <i>Out Of Control</i> |
| 0.016383 | 0.01576 | 0.045224 | -0.01365 | <i>Out Of Control</i> |
| 0.014887 | 0.01576 | 0.044227 | -0.01266 | <i>Out Of Control</i> |
| 0.013272 | 0.01576 | 0.040115 | -0.00856 | <i>Out Of Control</i> |
| 0.010628 | 0.01576 | 0.047918 | -0.01634 | <i>Out Of Control</i> |
| 0.012584 | 0.01576 | 0.042904 | -0.01134 | <i>Out Of Control</i> |
| 0.014902 | 0.01576 | 0.041057 | -0.0095  | <i>Out Of Control</i> |
| 0.01768  | 0.01576 | 0.043324 | -0.01176 | <i>Out Of Control</i> |
| 0.015097 | 0.01576 | 0.040265 | -0.00871 | <i>Out Of Control</i> |
| 0.014258 | 0.01576 | 0.041571 | -0.01001 | <i>Out Of Control</i> |
| 0.025895 | 0.01576 | 0.046335 | -0.01476 | <i>Out Of Control</i> |
| 0.019525 | 0.01576 | 0.044227 | -0.01266 | <i>Out Of Control</i> |
| 0.016956 | 0.01576 | 0.040115 | -0.00856 | <i>Out Of Control</i> |

**Lampiran 12.** Nilai *Central Line (CL)*, *Upper Control Limit (UCL)* dan *Lower Control Limit (LCL)* peta kendali ISRT binomial EWMA untuk  $\lambda = 0.9$ .

| Zi       | CL      | UCL      | LCL      | Keterangan            |
|----------|---------|----------|----------|-----------------------|
| 0.013295 | 0.01576 | 0.080245 | -0.04867 | <i>Out Of Control</i> |
| 0.012868 | 0.01576 | 0.087294 | -0.05571 | <i>Out Of Control</i> |
| 0.013177 | 0.01576 | 0.085529 | -0.05394 | <i>Out Of Control</i> |
| 0.01612  | 0.01576 | 0.088228 | -0.05664 | <i>Out Of Control</i> |
| 0.018018 | 0.01576 | 0.094725 | -0.06312 | <i>Out Of Control</i> |
| 0.01911  | 0.01576 | 0.094116 | -0.06251 | <i>Out Of Control</i> |
| 0.013303 | 0.01576 | 0.08684  | -0.05525 | <i>Out Of Control</i> |
| 0.014114 | 0.01576 | 0.08311  | -0.05153 | <i>Out Of Control</i> |
| 0.017588 | 0.01576 | 0.10421  | -0.07259 | <i>Out Of Control</i> |
| 0.015152 | 0.01576 | 0.100172 | -0.06856 | <i>Out Of Control</i> |
| 0.016926 | 0.01576 | 0.089701 | -0.05811 | <i>Out Of Control</i> |
| 0.014343 | 0.01576 | 0.085107 | -0.05352 | <i>Out Of Control</i> |
| 0.024418 | 0.01576 | 0.095987 | -0.06438 | <i>Out Of Control</i> |
| 0.009795 | 0.01576 | 0.10421  | -0.07259 | <i>Out Of Control</i> |
| 0.017386 | 0.01576 | 0.094725 | -0.06312 | <i>Out Of Control</i> |
| 0.014834 | 0.01576 | 0.095349 | -0.06374 | <i>Out Of Control</i> |
| 0.019945 | 0.01576 | 0.094116 | -0.06251 | <i>Out Of Control</i> |
| 0.01628  | 0.01576 | 0.095349 | -0.06374 | <i>Out Of Control</i> |
| 0.016102 | 0.01576 | 0.099429 | -0.06782 | <i>Out Of Control</i> |
| 0.016342 | 0.01576 | 0.100172 | -0.06856 | <i>Out Of Control</i> |
| 0.014134 | 0.01576 | 0.097312 | -0.0657  | <i>Out Of Control</i> |
| 0.012389 | 0.01576 | 0.085529 | -0.05394 | <i>Out Of Control</i> |
| 0.009218 | 0.01576 | 0.107893 | -0.07626 | <i>Out Of Control</i> |
| 0.013422 | 0.01576 | 0.09352  | -0.06192 | <i>Out Of Control</i> |
| 0.016145 | 0.01576 | 0.088228 | -0.05664 | <i>Out Of Control</i> |
| 0.019193 | 0.01576 | 0.094725 | -0.06312 | <i>Out Of Control</i> |
| 0.013956 | 0.01576 | 0.085958 | -0.05437 | <i>Out Of Control</i> |
| 0.013724 | 0.01576 | 0.089701 | -0.05811 | <i>Out Of Control</i> |
| 0.031661 | 0.01576 | 0.103356 | -0.07173 | <i>Out Of Control</i> |
| 0.016916 | 0.01576 | 0.097312 | -0.0657  | <i>Out Of Control</i> |
| 0.015411 | 0.01576 | 0.085529 | -0.05394 | <i>Out Of Control</i> |