**Quantitative Methods 2019-2020**

**Final Exam**

**Referral/Deferral Semester**

**ID:00010384**

**Section 1 Set C.**

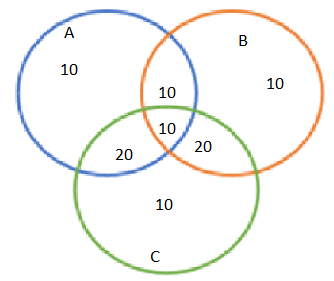
**Q1.**

**1 - 1 –= 1 –**

**P =**

**1 – P = 1 – 0.3205 = 0.6795 ≈ 68%**

**Q2.**

****

**P (A) = 10%+10%+10%+20%=50%**

**P (A) = 50%**

**P (A-1) = 1 – 50% ≈ 1 – 0.5 = 0.5**

**P (A-1) = 0.5**

**Section 2 Set E.**

**Q3.**

**Additive method**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Quarter 1** | **Quarter 2** | **Quarter 3** | **Quarter 4** |
| **2015** |  |  |  |  |
| **2016** |  | **-1500.12** | **-640.37** | **2862.88** |
| **2017** | **-514.87** | **-2069.5** | **-640** | **4403.75** |
| **2018** | **-1845.75** | **-1533** | **293.63** | **1934.38** |
| **2019** | **-400** | **-2043** |  |  |
| **Total** | **-2760.62** | **-7145.62** | **-986.74** | **9201.01** |
| **Average** | **-920.20** | **-1786.40** | **-328.91** | **3067** |
| **Adjustment** | **7.87** | **7.87** | **7.87** | **7.87** |
| **Seasonal V.** | **-928.07** | **-1794.27** | **-336.78** | **3059.13** |

**Multiplicative method**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Quarter 1** | **Quarter 2** | **Quarter 3** | **Quarter 4** |
| **2015** |  |  |  |  |
| **2016** |  | **0.91** | **0.96** | **1.16** |
| **2017** | **0.97** | **0.88** | **0.96** | **1.22** |
| **2018** | **0.90** | **0.92** | **1.01** | **1.09** |
| **2019** | **0.97** | **0.89** |  |  |
| **Total** | **2.84** | **3.6** | **2.93** | **3.47** |
| **Average** | **0.94** | **0.9** | **0.97** | **1.15** |
| **Adjustment** | **0.99** | **0.99** | **0.99** | **0.99** |
| **Seasonal V.** | **0.94** | **0.90** | **0.97** | **1.16** |

**Q4.**

Since seasonality is constant, this suggests that there is not such a big difference between the quarterly changes, on the basis of this it is best to use the additive method.

**Q5.**

**Formula:** 

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Quarter** | **Sales** | **Chain based index** |
| **2015** | Q1 |  |  |
|  | Q2 |  |  |
|  | Q3 |  |  |
|  | Q4 | 21,507 |  |
| **2016** | Q1 | 15,177 | 70.568% |
|  | Q2 | 15,662 | 103.196% |
|  | Q3 | 16,722 | 106.768% |
|  | Q4 | 20,668 | 123.598% |
| **2017** | Q1 | 17,658 | 85.436% |
|  | Q2 | 16,723 | 94.705% |
|  | Q3 | 18,563 | 111.003% |
|  | Q4 | 23,784 | 128.126% |
| **2018** | Q1 | 17,826 | 74.950% |
|  | Q2 | 17,973 | 100.825% |
|  | Q3 | 19,645 | 109.303% |
|  | Q4 | 21,376 | 108.811% |
| **2019** | Q1 | 18,997 | 88.871% |
|  | Q2 | 17,524 | 92.246% |
|  | Q3 | 19,737 | 112.628% |
|  | Q4 | 22,661 | 114.815% |

**Q6.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Quarter** | **Sales** | **Chain based index** |
| **2015** | Q1 |  |  |
|  | Q2 |  |  |
|  | Q3 |  |  |
|  | Q4 | 137,883 |  |
| **2016** | Q1 | 133,195 | 96.6% |
|  | Q2 | 132,295 | 99.3% |
|  | Q3 | 130,702 | 98.8% |
|  | Q4 | 139,345 | 106.6% |
| **2017** | Q1 | 134,509 | 96.5% |
|  | Q2 | 134,461 | 100% |
|  | Q3 | 134,034 | 99.7% |
|  | Q4 | 142,893 | 106.6% |
| **2018** | Q1 | 136,160 | 95.3% |
|  | Q2 | 135,979 | 99.9% |
|  | Q3 | 133,195 | 98% |
|  | Q4 | 141,518 | 106.2% |
| **2019** | Q1 | 137,431 | 97.1% |
|  | Q2 | 137,783 | 100.3% |
|  | Q3 | 136,300 | 98.9% |
|  | Q4 | 142,211 | 104.3% |

**Q7.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **x - GDP** | **y - Revenue** | **x-x̅** | **y-y̅** | **(x-x̅)( y-y̅)** | **(x-x̅)2** | **(y-y̅)2** |
| **2015 Q4** | 137883 | 21507 | 1419 | 2554 | 3623225 | 2013561 | 6522916 |
| **2016 Q1** | 133195 | 15177 | -3269 | -3776 | 12345077 | 10686361 | 14258176 |
| **2016Q2** | 132295 | 15662 | -4169 | -3291 | 13721341 | 17380561 | 10830681 |
| **2016Q3** | 130702 | 16722 | -5762 | -2231 | 12855809 | 33200644 | 4977361 |
| **2016Q4** | 139345 | 20668 | 2881 | 1715 | 4940310 | 8300161 | 2941225 |
| **2017Q1** | 134509 | 17658 | -1955 | -1295 | 2532182 | 3822025 | 1677025 |
| **2017Q2** | 134461 | 16723 | -2003 | -2230 | 4467477 | 4012009 | 4972900 |
| **2017Q3** | 134034 | 18563 | -2430 | -390 | 947838 | 5904900 | 152100 |
| **2017Q4** | 142893 | 23784 | 6429 | 4831 | 31056794 | 41332041 | 23338561 |
| **2018Q1** | 136160 | 17826 | -304 | -1127 | 343006 | 92416 | 1270129 |
| **2018Q2** | 135979 | 17973 | -485 | -980 | 475646 | 235225 | 960400 |
| **2018Q3** | 133195 | 19645 | -3269 | 692 | -2262392 | 10686361 | 478864 |
| **2018Q4** | 141518 | 21376 | 5054 | 2423 | 12244987 | 25542916 | 5870929 |
| **2019Q1** | 137431 | 18997 | 967 | 44 | 42532 | 935089 | 1936 |
| **2019Q2** | 137783 | 17524 | 1319 | -1429 | -1884347 | 1739761 | 2042041 |
| **2019Q3** | 136300 | 19737 | -164 | 784 | -128853 | 26896 | 614656 |
| **2019Q4** | 142211 | 22661 | 5747 | 3708 | 21308567 | 33028009 | 13749264 |
| **Total** | **2319894** | **322203** |  |  | **116629199** | **198938936** | **94659164** |
| **Mean** | **136464** | **18953** |  |  | **6860541** |  |  |

**Formula:**

=

=

**Cov=**  = 403561.23

= 3420.86

= 2359.7

**Correlation** =

**Q8.**

This Correlation shows the affiliation between the GDP and financial statement, which is shown above. Since correlation is positive number, it means there is a certain relation.

**Section 3 Set B.**

**Q9.**

**AT =**

**AT**B =

**AT**B – C =

**-1 =**

**Q10.**

in this case, the median is best suited, since we have outliers and the data are unequally allocated, and the allocation is skewed. And still it is necessary to add that since the median does not include all these extremely high and low values, and the mean includes. This feature can be very handy, given that the accumulation of data points is in the middle.