**ASSIGNMENT**

**PREPARED BY DR Z. JANNOO**

**QUESTION 1**

1. The monthly production of factories A and B in thousands of units are as follows:

A: 23 30 28 31 29 26 34 36 28

B: 53 65 70 50 62 58 52 63 69

Calculate the variability of production for the two factories and hence comment on your result.

[6 marks]

1. The probability that a man now aged 59 years will be alive in 2017 is 0.625 while the probability that his wife now aged 57 years will be alive is 0.833. Determine the probability that in 2017:
2. Both will be alive;
3. At least one of them will be alive;
4. Only wife will be alive.

[4 marks]

1. The table below shows the percentage turnover of a labour force of company Y over a four-year period.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Percentage Turnover of Labour force** | | | |
|  | **Quarter** | | | |
| **Year** | **1** | **2** | **3** | **4** |
| 2000 | 11 | 23 | 16 | 8 |
| 2001 | 14 | 29 | 16 | 9 |
| 2002 | 18 | 34 | 17 | 9 |
| 2003 | 19 | 42 | 23 | 12 |

1. Smoothe this time series by means of a centred four-quarterly moving average.
2. Calculate the average seasonal variations using an additive model.

[4+6 marks]

**TOTAL = 20 MARKS**

**QUESTION 2**

150 new recruits to a large organistation were divided at random into 5 groups of 30. The groups were given different lengths of training in the use of equipment and then were tested on their competence in using that equipment. The average competence score per group, y, is measured out of 100, with higher scores indicating greater average competence. The data is summarised in the table given below.

|  |  |  |
| --- | --- | --- |
| **Group** | **Training in days (x)** | **Meancompetence score (y)** |
| 1 | 4 | 73 |
| 2 | 6 | 77 |
| 3 | 8 | 81 |
| 4 | 10 | 85 |
| 5 | 12 | 88 |

(a) Find the least squares regression line for mean competence score regressed on number of days of training. [8 marks]

(b) Interpret the regressionequationobtained in part (a). [3 marks]

I Estimate the meancompetence score for :

(i) 7 days of training; [2 marks]

(ii) 19 days of training. [2 marks]

(d) Compute the PPMC coefficient for the above data and interpret your result. [5 marks]

**TOTAL = 20 MARKS**