****

**GARISSA UNIVERSITY**

**REGULAR UNIVERSITY EXAMINATIONS 2020/2021 ACADEMIC YEAR**

**FIRST YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF EDUCATION ARTS**

**GCC 121: QUANTITATIVE SKILLS**

**DATE: TIME: 2 HOURS**

**EXAMINATION DURATION: 2 HOURS**

**DATE: TIME:**

**INSTRUCTION TO CANDIDATES**

* **The examination has Five (5) questions**
* **Question ONE (1) is COMPULSORY**
* **Choose any other TWO (2) questions from the remaining FOUR (4) questions**
* **Use sketch diagrams to illustrate your answer whenever necessary**
* **Do not carry mobile phones or any other written materials in examination room**
* **Do not write on this paper**

**QUESTION ONE (30 Marks)**

1. Define the term statistics and explain the two broad categories of statistics as applied in quantitative skills **[3 marks]**
2. Distinguish between
3. Purposive and quota sampling
4. Systematic sampling and stratified sampling **[2 marks]**
5. A tycoon has 3 house girls who he pays 4,000 shillings each per month, 2 watchmen who he pays 5,000 shillings each per month and some garden men who receive 7,000 shillings each per month. If he pays out an average of 5,700 shillings per month to these people, find the number of garden men  **[4 marks]**
6. The table below shows a frequency distribution on marks of a final examination by Education students

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Marks | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 |
| No. of students | 1 | 3 | 11 | 21 | 43 | 32 | 9 |

Use the given data to compute the mean and the standard deviation **[7 marks]**

1. Give a brief distinction between mean absolute deviation and quartile deviation. **[2 marks]**
2. Obtain the quartile deviation and the mean absolute deviation for the data: 119, 113, 114, 112, 111, 115, 118, 114, 117, 113, and 119 **[4 marks]**
3. In a group of 100 persons, 72 people can speak English and 43 can speak French. How many can speak English only? How many can speak French only and how many can speak both English and French? **[2 marks]**
4. The data given below are obtained from student records.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | 8.3 | 8.6 | 9.2 | 9.8 | 8.0 | 7.8 | 9.4 | 9.0 | 7.2 | 8.6 |
| Y | 2300 | 2250 | 2380 | 2400 | 2000 | 2100 | 2360 | 2350 | 2000 | 2260 |

Calculate the rank correlation coefficient. **[5 marks]**

**QUESTION TWO**

1. Name any four characteristics of good sampling scheme **[4 marks]**
2. A study was conducted to find whether there is any relationship between the weight and blood pressure of an individual. The following set of data was arrived at from a clinical study

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ID | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Weight(x) | 78 | 86 | 72 | 82 | 80 | 86 | 84 | 89 | 68 | 71 |
| Blood Pressure (y) | 140 | 160 | 134 | 144 | 180 | 176 | 174 | 178 | 128 | 132 |

1. Find the least square regression equation relating the blood pressure (y) of the individual to their weight (x) [9 Marks]
2. Calculate the Pearson Product Moment correlation coefficient for the data. Comment on your result. [4 Marks]
3. Estimate the weight of an individual whose blood pressure is 150 [3 Marks]

**QUESTION THREE**

1. Define the term time series and discuss four components of a time series [5 Marks]
2. Assuming a 5 yearly moving average, calculate trend value from the data given below and plot the results on a graph [8 Marks]

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year  | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
| Production (thousands ) | 105 | 107 | 109 | 112 | 114 | 116 | 118 | 121 | 123 | 124 | 125 | 127 | 129 |

1. In a sample of 100 households in Garissa County, the following distribution of number of people per household was observed.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| No. of people (x) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| No. of households (f) | 7 | m | 20 | n | 18 | 10 | 5 |

The mean number of people per household was found to be 4. Calculate the missing frequencies, m and n. **[5 marks]**

**QUESTION FOUR**

1. Estimate the lower quartile and the 72nd percentile from the frequency table below. **[5 marks]**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Class | 1-4 | 5-8 | 9-12 | 13-16 | 17-20 | 21-24 |
| Frequency | 10 | 14 | 20 | 16 | 12 | 8 |

1. The data below show the number of pounds of each snack eaten during a rugby match.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Snacks | Chips | Bhajia  | Samosa  | Popcorn | Peanuts |
| Pounds in millions | 11.2 | 8.2 | 4.3 | 3.8 | 2.5 |

Construct a pie and a bar chart for the data **[6 marks]**

1. A fair die with faces 1 to 6 is rolled twice and the sum of the scores showing up noted. Let A be the event that the sum of the scores is greater than 7, and B be the event that the sum of the score is a multiple of 3 and C be the event that the sum of the scores is a prime number.
2. show that
3. find **[9 marks]**

**QUESTION FIVE**

1. Organize the data below into a grouped frequency table with the first group as 9.2 – 13.1.

15.0, 17.4, 10.3, 9.2, 20.7, 18.9, 16.6, 22.4, 23.7, 18.6, 26.1, 16.5, 19.7, 12.9, 15.7, 30.8, 15.4, 20.3, 24.0, 29.6, 18.3, 23.7, 17.8, 24.6, 23.0, 21.4, 32.8, 12.5, 17.5, 18.3, 23.2, 21.6, 20.8, 29.8, 24.5, 28.4, 13.5, 17.1, 27.1, 27.9

1. construct a relative frequency histogram **[8 Marks]**
2. Hence estimate Median and standard deviation [6 Marks]
3. Name the property of real numbers in each equation then find the value of x
4. [1 Mark]
5. [ Mark]
6. [1 Mark]
7. [1 Mark]
8. [1 Mark]
9. [1 Mark]