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**GARISSA UNIVERSITY**

**UNIVERSITY EXAMINATION 2018/2019 ACADEMIC YEARTWO**

**FIRST SEMESTER EXAMINATION**

**SCHOOL OF BUSINESS AND ECONOMICS**

**FOR THE DEGREE OF BACHELOR OF BUSINESS MANAGEMENT**

**COURSE CODE: BBM 221/ BHR 200**

**COURSE TITLE: BUSINESSS STATISTICS I**

**EXAMINATION DURATION: 2 HOURS**

**DATE: 29/11/18 TIME: 09.00-11.00 AM**

**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**
* **Programmable calculators are prohibited**

**This paper consists of FOUR (4) printed pages *please turn over***

**QUESTION ONE (COMPULSORY)**

1. Define the term statistics and explain the two broad categories of statistics **[3 marks]**
2. Distinguish between
3. Snowball and Quota sampling
4. Systematic sampling and stratified sampling **[2 marks]**
5. A tycoon has 3 house girls who he pays 4000 shillings each per month, 2 watch men who he pay 5000 shillings each and some gardeners who receive 7000 shillings each. If he pays out an average of 5700 shillings per month to these people, find the number of gardeners.  **[4 marks]**
6. The table below shows a frequency distribution on marks of a final examination by masters 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.

Hence obtain the quartile deviation and the mean absolute deviation for this data below 19, 13, 14, 12, 11, 15, 18, 14, 17, 13, 19 **[6 marks]**

1. Define the term index number **[2 marks]**
2. The frequency distribution shows the amount of pounds of each snack eaten during the super bowl.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Snacks | Potato chips | Tortilla chips | Pretzels | Popcorn | Snack nuts |
| 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]**

**QUESTION TWO**

1. Name any four limitations of sampling **[4 marks]**
2. The table below shows the marks of a student in two courses X and Y in Garissa University.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Course X | 65 | 78 | 59 | 43 | 36 | 56 | 43 |
| Course Y | 36 | 39 | 27 | 28 | 24 | 20 | 25 |

1. Fit a linear regression line to the above data.
2. Estimate the value of Y when X=50 **[7 marks]**
3. 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, B be the event that the sum of the scores is a multiple of 3 and C be the event that the sum of the scores is a prime number.
4. Show that P(AUB)=P(A)+P(B) - P(AB).
5. Find P(AUC), P(BC) and P(BC’) **[9 marks]**

**QUESTION THREE**

1. Explain three problems that are encountered in the construction of index numbers **[3 marks]**
2. A company manufactures four products A, B, C, D. The product prices and quantities are given.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 1990 | | 1992 | |
| Product | P | Q | P | Q |
| A | 26 | 18 | 40 | 19 |
| B | 80 | 8 | 90 | 5 |
| C | 45 | 16 | 41 | 18 |
| D | 50 | 14 | 54 | 12 |

Using 1990 as the base year calculate

1. Lasperyers Quantity index
2. Paasche’s Quantity index
3. Fishers Quantity index
4. Marshall-edge worth Quantity Index **(12 marks)**
5. In a sample of 100 household 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 household (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, the 4th decile, and the 72nd percentile for the frequency table below. **[6 marks]**

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

1. Assume that a population is composed of 900 elements with a mean of 20 units and a standard deviation of 12. What is the standard error of the sampling distribution if n=36 and if n=64 **[5 marks]**
2. A discrete random variable Y has a probability mass function given by the table below

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| y | 0 | 1 | 2 | 3 | 4 |
| P(Y=y) | c | 2c | 5c | 10c | 17c |

Find the value of the constant c and hence compute P (1≤Y<3).  **[4 marks]**

1. The discrete random variable X has the probability distribution shown below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| X | -3 | -2 | -1 | 0 | 1 |
| P(X=x) | 0.1 | 0.25 | 0.3 | 0.15 | k |

Find the value of k hence determine Var (X) **[5 marks]**

**QUESTION FIVE**

1. Organize the data below into a grouped frequency table starting with 9.2 – 13.1. Hence construct a relative frequency histogram and ogive 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  **[9 marks]**
2. Use the Bowley’s coefficient of skewness and the Kelly coefficient of skewness for the data below to estimate the skewness and kurtosis respectively hence interpret the results

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| class | 11-14 | 15-18 | 19-22 | 23-26 | 27-30 | 31-34 |
| Frequency | 10 | 14 | 20 | 16 | 12 | 8 |

**[6 marks]**

1. 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 r for the data **[5 marks]**