

**INSTITUTE OF BANKERS IN MALAWI**

**CERTIFICATE IN BANKING EXAMINATION**

**SUBJECT: FUNDAMENTALS OF BUSINESS STATISTICS**

**(IOBM – C103)**

**Date: Sunday, 6th November 2016**

**Time Allocated: 3 hours (08:00 – 11:00 am)**

**INSTRUCTIONS TO CANDIDATES**

1 This paper consists of **TWO** Sections, A and B.

2 Section A consists of 20 multiple questions, each question carries 2 marks.

Answer **ALL** questions.

3 Section B consists of 5 questions, each question carries 20 marks. Answer **ANY THREE** questions.

4 You will be allowed **10 minutes** to go through the paper before the start of the examination, you may write on this paper but not in the answer book.

5 Begin each answer on a new page.

6 **Please write your examination number on each answer book used. Answer books without examination numbers will not be marked.**

7 All persons writing examinations without payment will risk expulsion from the Institute.

8 If you are caught cheating, you will be automatically disqualified in all subjects seated this semester.

9 DO NOT open this question paper until instructed to do so.

**SECTION A (40 MARKS)**

Answer **ALL** questions from this section.

1. What type of data is the number of ads on a one-hour television show?

a. Nominal

b.Discrete

c. Qualitative

d. Continuous

1. The group of all subjects under study is called a \_\_\_\_\_\_\_\_\_\_

a. Sample

b**.** Population

c. Subjects

d. Random sample

1. Data collected over a period of time can be graphed using a \_\_\_\_\_\_\_\_ graph.

a.Pie chart

b. Time series

c. Ogive

d. Frequency polygon

**Classify each of the following variables for questions 4 – 6**

1. Ages of people working in a large factory

a. Continuous

b. Discrete

c. Ordinal

d. Nominal

1. Number of cups of coffee served at a restaurant

a. Continuous

b. Discrete

c. Ordinal

d. Nominal

1. The time it takes a student to drive to school

a. Continuous

b. Discrete

c. Ordinal

d. Nominal

1. Consider the values 0.9, 1.4, 2.8, 3.1 and 5.6. Find the mean

a. 3

b. 2.76

c. 2.8

d. 2

1. Which of the following is the correct definition of descriptive statistics?
2. Descriptive Statistics is the science of conducting studies to collect, organize, summarize, analyze, and draw conclusions from data.
3. Descriptive Statistics consists of the collection, organization, summarization, and presentation of data.
4. Descriptive Statistics consists of generalizing from samples to populations, performing estimations and hypothesis tests, determining relationships among variables, and making predictions.
5. None of the above
6. Except for rounding errors, to what sum do relative frequencies add up?

a. 0

b. 100

c. 50

d. 1

1. A researcher divided subjects into two groups according to gender and then selected members from each group for her sample. What sampling method was the researcher using?

a. Cluster

b. Random

c. Systematic

d. Stratified

1. Data on account types (savings, current, fixed deposits, investment) can be organized into a \_\_\_\_\_\_\_\_\_ frequency distribution.

a. Cumulative

b. Grouped

c. Relative

d. Categorical

1. Find the median for the daily vehicle pass charge for five National Parks in Malawi. The costs are K250, K150, K150, K200, and K150.

a. 200

b. 250

c. 150

d. None

1. The following is the number of service centres for six banks: 401, 344, 209, 201, 227, 353. Which of the following is the mode for the number of service centres:

a. 0

b. 000

c. No mode

d. 285.5

1. What is the sum of the probabilities of all outcomes in a probability distribution?

a. 0

c. 1

b. ½

d. It cannot be determined.

1. What is the complement of selecting a day of the week and getting a weekday?

a. Saturday and Sunday

b. Friday and Saturday

c. Friday

d. Saturday

1. The probability that an event happens is 0.42. What is the probability that the event won’t happen?

a. 0.58

c. 0

b. -0.42

d. 1

1. How many outcomes are generated by tossing three fair coins?

a. 2

c. 6

b. 4

d. 8

1. If all the points fall on a straight line, the value of r will be \_\_\_\_\_ or \_\_\_\_\_.

a. +1

b. -1

c. 0

d. a and b

1. What is the name given to the following chart?
2. Pareto chart
3. Pie chart
4. Split chart
5. Stem-leaf chart.
6. Consider the following stem and leaf display.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 3 | 3 |  |  |  | |
| 4 | 0 | 1 | 2 |
| 5 | 0 | 5 | 5 | 8 |  |
| 6 | 1 | 2 | 5 | 5 | 8 |
| 7 | 0 | 5 | 5 | 6 | 7 |
| 8 | 0 | 2 | 2 | 3 | 3 4 |
| 9 | 0 | 1 | 2 | 5 | 7 9 |

What is the range of the data represented by the stem and leaf display?

1. 66
2. 6
3. 99
4. 84

**SECTION B (60 MARKS)**

Answer **ANY THREE** questions from this section

**QUESTION 2**

1. The probability that a customer selects a current account or savings account is 0.55, and the probability that the customer selects only current account is 0.32.

**Required:**

If the probability that he or she selects only a savings account is 0.17, find the probability of the customer selecting both accounts. *(3 marks)*

1. List any **three** non-probabilistic sampling techniques? *(3 marks)*
2. Name and define any **three** measures of dispersion. *(9 marks)*
3. The mean of the number of sales of cars over a 3-month period is 87, and the standard deviation is 5. The mean of the commissions is MK 5,225,000, and the standard deviation is MK 773,000.

**Required:**

Compare the variations of the two and draw a conclusion. *(5 marks)*

**(TOTAL 20 marks)**

**QUESTION 3**

1. Define the following terms:
2. Continuous variable. *(2 marks)*
3. Sample. *(2 marks)*
4. Random sampling. *(2 marks)*
5. Mode. *(2 marks)*
6. The following data show the allowances for senior executives at a certain bank (in thousands of Kwacha) for a specific month.

|  |  |  |  |
| --- | --- | --- | --- |
| 99 | 105 | 106 | 102 |
| 102 | 93 | 109 | 106 |
| 77 | 91 | 103 | 118 |
| 97 | 100 | 107 | 103 |
| 94 | 109 | 100 | 98 |
| 84 | 92 | 98 | 110 |
| 94 | 104 | 98 | 123 |
| 102 | 99 | 100 | 107 |

**Required:**

1. Were the data obtained from a population or a sample? Explain your answer*.*

*(2 marks)*

1. Construct a frequency distribution for the allowances using seven classes of equal width showing class limits, class boundaries, tallies and frequencies. ***Hint*:** the starting point should be the lowest value in the data set. *(5 marks)*
2. Are there any peaks in the distribution? *(1 marks)*
3. Identify any possible outliers. *(2 marks)*
4. Write a brief summary of the nature of the data as shown in the frequency distribution. *(2 marks)*

**(TOTAL20 marks)**

**QUESTION 4**

1. What is the difference between Subjective probability and Objective probability?

*(4 marks)*

1. Suppose that P (A) = 0.42, P (B) = 0.38, and P (A ∪ B) = 0.70.

**Required:**

*Explain if A and B are mutually exclusive? (2 marks)*

1. A small company consists of the owner, the manager, the salesperson, and two technicians, all of whose annual salaries are listed in the following table.

|  |  |
| --- | --- |
| **Staff** | **Salary (K)** |
| Owner | 500,000 |
| Manager | 200,000 |
| Salesperson | 120,000 |
| Technician | 90,000 |
| Technician | 90,000 |

**Required**

Assuming that this is the entire population, find the following:

1. Mean. *(3 marks)*
2. Median. (*1 mark)*
3. Mode. (*1 mark)*
4. The salaries for the staff of the Masamba Tea Manufacturing Co. are shown in the following table.

|  |  |
| --- | --- |
| **Staff** | **Salary (K)** |
| Owner | 100,000 |
| Manager | 40,000 |
| Sales representative | 30,000 |
| Category 1 Workers | 25,000 |
| Category 2 Workers | 15,000 |
| Category 3 Workers | 18,000 |

**Required:**

Find the range. *(2 marks)*

1. The following data represent car sales (MK million) for a certain car firm over the past six years .

11.2, 11.9, 12.0, 12.8, 13.4, 14.3

**Required:**

Find the following:

1. Sample variance. *(5 marks)*
2. Standard deviation. *(2 marks)*

**(Total 20 marks)**

**QUESTION 5**

1. Write down any **two** rules of probability. *(4 marks)*
2. The digits 0, 1, 2, 3 and 4 are to be used in a four-digit ID card. How many different cards are possible if:
3. Repetitions are permitted? *(2 marks)*
4. Repetitions are not permitted? *(2 marks)*
5. A bank’s service centre has 24 tellers and 4 of whom are supervisors. The Bank Manager selects 4 tellers at random.

**Required:**

Find the following probabilities:

1. Exactly two are supervisors. *(3 marks)*
2. None is a supervisors. *(2marks)*
3. At least one is a supervisors. *(3 marks)*
4. What is meant by a positive relationship between variables in regression? *(2 marks)*
5. Given that two variables are linearly related, write down the **two** least squares equation formula for finding the y-intercept and the coefficient of x. *(2 marks)*

**(Total 20 marks)**

**QUESTION 6**

1. Find and for the data set of account balance for eight businessmen 15, 13, 6, 5, 12, 50, 22, 18. *(4 marks)*
2. The data shown below is for car rental companies in Malawi for a recent year.

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Cars (in ten thousands)** | | **Revenue (in Millions)** |
| 1 | | 63.0 | 7.0 |
| 2 | | 29.0 | 3.9 |
| 3 | | 20.8 | 2.1 |
| 4 | | 19.1 | 2.8 |
| 5 | | 13.4 | 1.4 |
| 6 | | 8.5 | 1.5 |

**Required:**

1. State the predictor variable and the response variable with reason(s). *(3 marks)*
2. Construct a scatter plot for the data and comment on the output*. (5 marks)*
3. Compute the correlation coefficient for the data and comment on the value of the correlation coefficient. *(8 marks)*

**(Total 20 marks)**

**END OF EXAMINATION PAPER**