

**INSTITUTE OF BANKERS IN MALAWI**

**CERTIFICATE IN BANKING EXAMINATION**

**SUBJECT: FUNDAMENTALS OF BUSINESS STATISTICS**

**(IOBM – C103)**

**Date: Wednesday, 17th May 2017**

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

**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 when 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. All answer books without examination number 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)**

Circle **ALL** correct answers from this section in the answer sheet provided.

1. The probability of an event can assume any value between

A. - 1 and +1

B. - 1 and 0

C. 0 and +1

D. None of the above

1. In computing descriptive statistics from grouped data,

A. data values are treated as if they occur at the midpoint of a class.  
 B. the grouped data result is more accurate than the ungrouped result.  
 C. the grouped data computations are used only when a population is being analyzed.  
 D. All of the above answers are correct.

1. Which one of the following variables is **NOT** categorical?

A. Age of a person.

B. Gender of a person: male or female.

C. Choice on a test item: true or false.

D. Marital status of a person (single, married, divorced, other).

1. Which one of these statistics is unaffected by outliers?

A. Mean

B. Interquartile range

C. Standard deviation

D. Range

**For questions 5 and 6 use the following information:**

A survey asked customers how often their cheques have been referred to drawer. The data are then categorized into the following contingency table of counts showing the relationship between age group and response.

|  |  |  |  |
| --- | --- | --- | --- |
| Age (years) | Frequency cheques are referred to drawer | | Total |
| Very often | Not often |
| Under 30 | 100 | 100 | 200 |
| Over 30 | 40 | 160 | 200 |
| Total | 140 | 260 | 400 |

1. Among customers with age over 30, what's the probability their cheques would be referred to drawer ‘very often’?

A. 0.20

B. 0.40

C. 0.33

D. 0.5

1. What is the probability that a customer’s cheque would be referred to drawer “not often’?

A. 0.35

B. 0.40

C. 0.65

D. 0.45

1. The following **CANNOT** be used to present discrete data

A. Bar chart

B. Histogram

C. Pie chart

D. Stem and leaf display

1. If  for any event A, then , the complementary probability, is:

A. 1

B. 0

C. 

D. 

1. The goal of \_\_\_\_\_\_\_\_\_\_\_ is to focus on summarizing and explaining a specific set of data.

A. Inferential statistics

B. Descriptive statistics

C. None of the above

D. All of the above

1. Suppose A and B are two independent events with P(A) = 0.2 and P(B) = 0.4. Then P(A or B) is:

A. 0.08

B. 0.12

C. 0.52

D. 0.62

1. Non-overlapping categories or intervals are known as

A. Inclusive

B. Exhaustive

C. Mutually exclusive

D. Mutually exclusive and exhaustive

1. The set of procedures used to explain or predict the values of a dependent variable based on the values of one or more independent variables is called

A. analysis

B. Regression coefficient

C. Regression equation

D. Regression line

1. The set of all possible outcomes in an experiment is called

A. population

B. event

C. sample space

D. none of these

**Use the information below to answer questions 14 and 15 that follow immediately after:**

Following is a stem and leaf display of ages of customers applying for an overdraft facility:

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

1. The mode of this distribution is \_\_\_\_\_\_.

A. 45

B. 48

C. 14

D. 39

1. The range of this distribution is \_\_\_\_\_\_.

A. 35

B. 48

C. 52

D. 45

1. The difference between the largest and the smallest data values is the

A. variance  
 B. interquartile range  
 C. range  
 D. coefficient of variation

1. Which of the following is **NOT** a measure of central location?

A. mean  
B. median  
C. variance  
D. mode

1. If a data set has an even number of observations, the median

A. cannot be determined  
 B. is the average value of the two middle items  
 C. must be equal to the mean  
 D. is the average value of the two middle items when all items are arranged in ascending order

1. The coefficient of skewness \_\_\_\_\_\_.

A. is the same as quartile deviation.  
B. is the average value of a distribution.  
C. describes the shape of a distribution.  
D. none of these.

1. The most frequently occurring value of a data set is called the

A. range  
 B. mode  
 C. mean  
 D. median

**SECTION B (60 MARKS)**

Answer **ANY THREE** questions from this section

**QUESTION 2**

1. (i) What is the difference between continuous data and discrete data? *(4 marks*

(ii) Give **two** examples of discrete data and **two** examples of continuous data. *(4 mark*s)

1. A bank is studying the number of customers that use its ATMs during lunch hour. An analyst collects data from 30 ATMs and the data collected showed the following distribution.

42 26 35 18 27 17 36 16 45 38

29 46 20 38 22 34 52 33 40 31

48 39 26 51 19 28 49 35 55 37

**Required:**

1. Find the average number of customers that use the ATMs during lunch hour. (*3 marks)*
2. Using 15 as the lowest class limit and a class width of 10, produce a grouped frequency distribution to present this set of data. (*4 marks)*
3. Using the data presented in the grouped frequency distribution, calculate the mean. (*5 marks)*

**(Total 20 marks)**

**QUESTION 3**

1. (i) List down any **two** sources of data. *(2 marks)*

(ii) Give **one** advantage for each data source listed in part (i). *(4 marks)*

1. (i) Give any **two** reasons why researchers prefer using a sample instead of the whole population. *(4 marks)*

(ii) Distinguish between systematic sampling and stratified sampling. *(4 marks)*

(iii) State any **two** advantages and **one** disadvantage of stratified sampling.

*(6 marks)*

**(Total 20 marks)**

**QUESTION 4**

1. Distinguish between regression and correlation. *(4 marks)*
2. The following table shows the number of visits made by a bank’s customer consultants and the number of new customers attracted.

|  |
| --- |
| Month 1 2 3 4 5 6 7 8 9 10 |
| No. of visits 4 3 2 2 4 5 3 1 2 4  No of customers 58 47 35 30 52 44 37 19 34 44 |

**Required:**

1. Plot a scatter diagram. *(4 marks)*
2. Find the equation of the least squares regression line and plot the line on the scatter diagram. *(9 marks)*
3. Use the regression line obtained to forecast the number of new customers that may be attracted if 8 visits were made. *(3 marks)*

**(Total 20 marks)**

**QUESTION 5**

1. State a scenario or circumstance when it is ideal to use the following charts or diagrams:
2. Histogram
3. Multiple bar chart. *(4 marks)*
4. A bank has four service centres with the following number of customers over the past five years:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Account type** | **Service centre** | | | |
| Masasa | Jali | Ndix | Kawale |
| Savings  Current  Fixed deposit | 38  24  16 | 86  74  50 | 82  60  55 | 25  32  20 |

**Required:**

1. Suggest **two** appropriate diagrams or charts that you would use to present the given data, giving a reason for each. Assume you want to present the data in a single diagram or chart. *(4 marks)*
2. Present the data using a diagram or chart that you have suggested in part (i). You are advised to put service centres on the horizontal axis. *(6 marks)*
3. A warehouse classifies stock items in three categories, A, B and C. On all category A items, it promises a service level of 97% (i.e. there is a probability of 0.97 that the warehouse can meet demand from stock). On category B and C items, it promises service levels of 94% and 90% respectively.

**Required:**

What is the probability that the warehouse can immediately supply an order for:

1. One item of category A and one item of category B? *(3 marks)*
2. One item from each category? *(3 marks)*

**(Total 20 marks)**

**QUESTION 6**

1. (i) What is a random sample?  **(***2 marks)*

(ii) State any **one** reason why some researchers prefer to use face to face interviews and **one** reason why others do not prefer them. *(4 marks)*

(iii) Give **two** advantages of using internal data sources. *(4 marks)*

1. The following data show the number of fraud cases recorded over a period of 12 months.

12 18 21 12 25 16 20 12 25 12 32 12

**Required:**

1. Find the standard deviation of the distribution. *(5 marks)*
2. Calculate the Pearson’s coefficient of skewness and interpret the result obtained. *(5 marks)*

**(Total 20 marks)**

**END OF THE EXAMINATION PAPER**