

**INSTITUTE OF BANKERS IN MALAWI**

**CERTIFICATE IN BANKING EXAMINATION**

**SUBJECT: FUNDAMENTALS OF BUSINESS STATISTICS**

**(IOBM – C103)**

**Date: Sunday, 3rd November 2013**

**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 30 multiple choice questions, each carries 2 marks.

Answer **ALL** questions.

3 Section B consists of 4 questions, each question carries 20 marks.

Answer **ANY TWO** 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 and not your student number on each answer book used. Answer sheets without examination numbers will not be marked.**

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

**SECTION A (60 MARKS)**

**Answer ALL questions**

Q1. The following are monthly bank charges applied by eight different banks on customers who use their ATMs: K650, K450, K400, K500, K600 and K550. The mean monthly bank charge is:

1. K525
2. K550
3. K500
4. K650

Q2. Information is:

1. A set of individual values (observations) or measurements on an issue
2. Processed data.
3. A set of statistics collected for analysis
4. Data to be generated.

Q3. The coefficient of determination is the:

a. Ratio of the explained variation to the total deviation.

b. Ratio of the unexplained deviation to the explained deviation.

c. Ratio of the unexplained deviation to the total variation.

d. Ratio of the explained variation to the total variation.

Q4. The interval between the upper quartile and the lower quartile is known as the:

a. mean

b. interquartile range

c. standard deviation

d. median

Q5. A population is:

1. A number or measurement collected as a result of observation
2. A characteristic which is measurable
3. The number of objects or individuals selected for study by a researcher
4. A complete set of individuals, objects, or measurements having some common observable characteristics.

Q6. Consider the following:

0 7 8 9

1 1 2 3 4 4 6 7 8 8 9

2 2 2 4 5

3 0 2 2 3 4 5

4 1 3 5 6

5 1 6

This is called

* 1. Box plot
  2. Frequency plot
  3. Stem and leaf display
  4. Frequency polygon.

Q7. The mode minimum bank balance on savings accounts in the banking sector is K5000. What does this tell you about the minimum bank balance on savings accounts in the banking sector?

1. Half the banks have minimum bank balances of more than K5000 while the other half has lower than K5000 minimum balances.
2. The average minimum bank balances on savings accounts in the banking sector is K5000.
3. More banks have minimum bank balances of K5000 on savings accounts in the banking sector than any other amount.
4. The minimum bank balance of all banks is not very consistent because K5000 is such a large number.

Q8. Which of the following divides a group of data into four subgroups?

1. Quartiles
2. Percentiles
3. Standard deviation
4. Median

Q9 The mean of a distribution is 23, the median is 24, and the mode is 25.5. It is most likely that this distribution is:

1. Negatively skewed
2. Positively skewed
3. Symmetrical
4. Asymptotic.

Q10. Which of the following variables is not categorical?

1. Age of a person
2. Gender of a person
3. Nationality of a person
4. Marital status of a person

Q11. Which one of these statistics is not sensitive to outliers?

1. Mean c) Standard deviation
2. Inter-quartile range d) Range

Q12. How would an outlier affect the value of a correlation coefficient?

1. It will always reduce the value of a correlation coefficient.
2. It will always increase the value of a correlation coefficient.
3. It will have no effect on the value of a correlation coefficient.
4. It will either reduce or increase the value of a correlation coefficient, depending on its relative position.

Q13. In a certain game of chance, your chances of winning are 0.2. If you play the game five times and outcomes are independent, the probability that you win at least once is

1. 0.2000 c) 0.6723
2. 0.3277 d) 0.9997.

Q14. A set of data is found to have a sample standard deviation of 25. Suppose 9 were added to each of the numbers in the data. The standard deviation of the resulting data…..

1. Cannot be determined
2. Would be 28
3. Would be 34
4. Would be 25

Q15. A variable is a:

1. Number being measured
2. Value being measured in a population
3. Quantity that assumes or can assume different values at each Measurement or observation
4. Quantity whose values is known in advance for any parameter of interest in a population.

Q16. The following are the closing bank balances for 6 customers: K8000, K12500, K6500, K3200, K5100 and K9000. What is the median closing bank balance?

* + 1. K9300
    2. K7250
    3. K6500
    4. K8000.

Q17. Continuous data is best presented using

1. Histogram
2. Bar charts
3. Pie charts
4. Pictograms.

Q18. A bank selected 150 customers at random to determine the relationship between income levels and loan repayment default rate. The data obtained are listed in Table 1.

**Table 1**

|  |  |
| --- | --- |
| **Income level** (K’000) | **Number of defaulters in a year**  **None Once Twice Thrice Over3 times** |
| Under 20 20 – 29 30 – 39 40 – 49 Over 49 | 5 12 3 2 1 6 8 7 9 3 9 12 11 4 2 8 11 12 9 5 2 4 1 3 1 |

If a customer is selected at random, find the probability that the customer would be of K30,000 – K39,000 income level and having defaulted once or more.

1. 0.8
2. 0.313
3. 0.233
4. 0.193

Q19. If a customer is selected at random, find the probability that the customer would be of income level under K20000 or having defaulted more than three times in a year. ( **Note:** Use data in Table 1).

1. 0.847
2. 0.153
3. 0.080
4. 0.227

Q20. The annual salaries, K’000, of the part-time employees of a bank are illustrated in the histogram below:

Frequency



From the histogram, what would you say about the distribution of salaries? This distribution is:

a. Positively skewed

b. Negatively skewed

c. Symmetrical

d. Asymptotic.

**SECTION B (40 MARKS)**

Answer **ANY TWO** questions from this section.

**QUESTION 1**

(a) Briefly describe **two** ways of studying relationships between any two variables. (*4 marks)*

(b) A small firm has presented you with its figures on advertisement expenditure and sales for the last ten years as shown in the following table.

|  |  |  |
| --- | --- | --- |
| **Year** | **Advertising Expenditure (K’000)** | **Sales (K’000)** |
| 2002  2003  2004  2005  2006  2007  2008  2009  2010  2011 | 5  10  15  20  20  30  40  50  50  50 | 200  210  250  300  400  450  500  600  650  700 |

(i) Construct a scatter diagram of the data given.  *(4 marks)*

(ii) Calculate the product moment correlation coefficient. Briefly comment on your result. *(8 marks)*

(c) What is the difference between primary and secondary data. Give **an** example for each data type. (*4 marks)*

**(Total 20 marks)**

**QUESTION 2**

(a) Give any **four** reasons why sampling is important in the world of business. *(4 marks)*

(b) Discuss the relative advantages and disadvantages of the postal questionnaire and the postal interview. In each case give **two** advantages and **two** disadvantages *(8 marks)*

(c) (i) Compare simple random sampling and quota sampling as methods of collecting a representative sample from a population. *(4 marks)*

(ii) Give **one** advantage and **one** disadvantage of simple random sampling and quota sampling. *(4 marks)*

**(Total 20 marks)**

**QUESTION 3**

1. Suggest and describe any **two** ways of investigating the relationship between any two variables. *(4 marks)*
2. Consider the relationships given below. Which of the relationships are likely to have a positive correlation coefficient and which are likely to have a negative correlation coefficient? Explain why.
3. The demand for maize and their price
4. The average temperature of countries and the sales of warm clothing.
5. The population of countries and the amount of waste they generate.
6. The income of people and the amount of income tax they pay. (*8 marks)*
7. A bank has employed two Market Executives to market a new bank product. The salesmen, Mangani and Pindani, must each make two calls per day, one in the morning and one in the afternoon. Mangani has probability 0.5 of selling the product on any call, while Pindani has probability 0.2 of making a sale. Mangani works independently of Pindani and, for each market executive, morning and afternoon results are independent of each other.

**Required:**

Compute the probability that, in one day:

* + - 1. Mangani makes two sales (*4 marks)*
      2. Pindani makes at least one sale. (*4 marks)*

**(Total 20 marks)**

**QUESTION 4**

1. Give any **four** reasons why sampling is important in the world of business. *(4 marks)*
2. Discuss the relative advantages and disadvantages of the postal questionnaire and the postal interview. In each case give **two** advantages and **two** disadvantages *(8 marks)*
3. (i) Compare simple random sampling and quota sampling as methods of of collecting a representative sample from a population. *(4 marks)*

(ii) Give **one** advantage and **one** disadvantage of simple random sampling and quota sampling. *(4 marks)*

**(Total 20 marks)**

**QUESTION 5**

(a) Data may also be presented using frequency polygons. Give **one** advantage and **one** disadvantage of frequency polygons.  *(2 marks)*

(b) The following table shows the ranges of net wealth for a bank’s customers living in a semi-urban area in 2000 and 2010. The number of people has been expressed as a percentage of the total number of people in the relevant years.

|  |  |  |
| --- | --- | --- |
| Annual income (K) | % number of people | |
| 2000 | 2010 |
| Less than 5,000  5,000 but less than 10,000  10,000 but less than 15,000  15,000 but less than 20,000  20,000 but less than 25,000  25,000 but less than 30,000  30,000 but less than 35,000  35,000 but less than 50,000 | 22.9  31.7  16.2  18.8  6.2  1.2  1.9  1.1 | 11.6  19.6  11.8  24.4  20.8  3.8  5.6  2.4 |

1. Compile the cumulative frequency tables for 2000 and 2010.

*(4 marks)*

1. Plot the corresponding ogives on the same pair of axes. *(6 marks)*
2. Determine the lower and upper quartiles in each year and interpret the results. *(8 marks)*

(**Total 20 marks**)

**END OF EXAMINATION PAPER**