

**INSTITUTE OF BANKERS IN MALAWI**

**CERTIFICATE IN BANKING EXAMINATION**

**SUBJECT: FUNDAMENTALS OF BUSINESS STATISTICS (IOBM – C103)**

**Date: Monday, 30th April 2012**

**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 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. 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.

Q2. 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.

Q3. Continuous data is best presented using

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

Q4. 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

Q5. 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

Q6. 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

Q7. 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.

Q8. 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.

Q9. The interval between the upper quartile and the lower quartile is known as the:

a. mean

b. interquartile range

c. standard deviation

d. median

Q10. 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. boxplot
  2. frequency plot
  3. stem and leaf display
  4. frequency polygon.

Q11. 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.

Q12. 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.

Q13. Which of the following divides a group of data into four subgroups?

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

Q14 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.

Q15. The variable ‘satisfaction’, e.g. low, medium, high is:

1. nominal
2. ordinal
3. interval
4. ratio.

Q16. The range of the correlation coefficient is:

1. -1 to 0.
2. 0 to 1.
3. -1 to 1.
4. -0.5 to 0.5

Q17. 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.

Q18. Any characteristic of a population distribution may properly be referred to as a

a. Standard deviation

b. Raw score

c. Standard score

d. Parameter.

Q19. The following pie chart shows how a bank clerk’s monthly expenses are divided.

If the bank clerk spends K15,000 per month for food, how much does he spend per month on his car.

a. K20,000

b. K18,000

c. K12,000

d. K10,000

Q20. The following table shows the total number of bank deposits that were recorded by the end of each of the first 5 weeks of the opening of a new service centre.

|  |  |
| --- | --- |
| Duration | Total number of deposits recorded |
| End of 1st week  End of 2nd week  End of 3rd week  End of 4th week  End of 5th week | 3200  5500  6800  7400  7700 |

How many deposits were recorded during the 3rd week of the opening of the service centre?   
a. 1,300

b. 2,800

c. 6,000

d. 1,600

Q21. Given that  and , the Spearman’s rank correlation coefficient is:

1. 0.532
2. 0.983
3. 0.953
4. 0.839

Q22. A researcher studying bank consumer preference questions every twentieth person entering Saferana Bank and asks them what type of account they have and the reason why. What is the name of the sampling method that he is employing?

a. Purposive sampling

b. Quota sampling

c. Cluster sampling

d. Systematic sampling.

Q23. If the standard deviation of a population is 9, the population variance is:

a. 3

b. 9

c. 21.35

d. 81.

Q24. Which of the following is not a measure of central tendency?

a. Percentile

b. Quartile

c. Standard deviation

d. Mode.

Q25. If the correlation coefficient r = 0.5 then the coefficient of determination is

a. 0.10

b. 0.25

c. 1.00

d. 2.50

Q26. The middle value of an ordered array of numbers is the

a. Mean

b. Median

c. Mode

d. Midpoint.

Q27. The method of choosing individuals from one or more populations for a statistical study is called:

a. census

b. survey

c. randomisation

d. sampling.

Q28. An analysis of customer complaints carried out by the customer care department of a bank in the past 216 days revealed an average of 7.94 and median of 7.17 complaints with a standard deviation of 6.45. The Pearson’s coefficient of skewness is:

a. 0.358

b. - 0.358

c. 0.583

d. 0.853.

Q29. The mean gross salary of a group of 100 men and women is K160,000. If the number of men in the group is 60 and the mean gross salary K180,000, what is the mean gross salary of the women.

1. K120,000
2. K125,000
3. K130,000
4. K132,000.

Q30. The qualities of good information include the following but excluding:

a. timely

b. accurate

c relevant

d. general.

**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) A bank is studying deposits made by 200 of its customers on a particular day.

|  |  |
| --- | --- |
| **Deposits** (K’000) | **Number of companies** |
| Below 30  30 and less than 60  60 and less than 90  90 and less than 150  150 and less than 300  300 and less than 600  and less than 1,000 | 52 50 37 29 21 8 3 |

1. Estimate the amount deposited on this particular day. *(3 marks)*
2. Calculate the standard deviation of deposits made. *(4 marks)*
3. Construct a cumulative curve and use your curve to estimate the median. *(6 marks)*

(b) The accounts of a bank are failing to balance. The supervisor decides to give the problem to three staff members in his department whose chances of solving it independently are ,  and respectively.

Find the probability that

(i) The problem is solved.  *(3 marks)*

(ii) At least two of them are able to solve the problem. *(4 marks)*

**(Total 20 marks)**

**QUESTION 3**

(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 4**

(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**