

**INSTITUTE OF BANKERS IN MALAWI**

**CERTIFICATE IN BANKING EXAMINATION**

**SUBJECT: FUNDAMENTALS OF BUSINESS STATISTICS**

**(IOBM – C103)**

**Date: Sunday, 3rd May 2015**

**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 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)**

Answer **ALL** questions from this section

1. ATM records indicated that customers stayed on the queue for the number of minutes shown in the distribution below.

|  |  |
| --- | --- |
| **Number of Min** | **Frequency** |
| 3 | 15 |
| 4 | 32 |
| 5 | 56 |
| 6 | 19 |
| 7 | 5 |
|  | 127 |

Find the probability that a customer stayed on the queue for at most 4 minutes.

1. 47/127
2. 80/127
3. 15/127
4. 32/127
5. What type of data is the number of ads on a one-hour television show?
6. Nominal
7. Qualitative
8. Discrete
9. Continuous
10. The strength of the linear relationship between two quantitative variables is determined by the value of

13. The equation of the regression line used in statistics is
15. The coefficient of determination is
17. What are the boundaries of 25.6 ounces?
18. 25–26 ounces
19. 25.55–25.65 ounces
20. 25.5–25.7 ounces
21. 20–39 ounces
22. 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?
23. Cluster
24. Random
25. Systematic
26. Stratified
27. What is another name for the ogive?
28. Histogram
29. Frequency polygon
30. Cumulative frequency graph
31. Pareto chart
32. Even if the correlation coefficient is high (near +1) or low (near -1), it may not be significant.
    1. True
    2. False
33. What graph should be used to show the relationship between the parts and the whole?
34. Histogram
35. Pie graph
36. Pareto chart
37. Ogive
38. Except for rounding errors, what sum should relative frequencies add up to?
39. 0
40. 1
41. 50
42. 100
43. What is the value of the mode when all values in the data set are different?
44. 0
45. 1
46. There is no mode.
47. It cannot be determined unless the data values are given.
48. When data are categorized as, for example, places of residence (rural, suburban, urban), the most appropriate measure of central tendency is the
49. Mean
50. Median
51. Mode
52. Midrange
53. corresponds to
54. Inter-Quartile Range
55. Median
56. A statistic that tells the number of standard deviations data value is above or below the mean is called
57. A quartile
58. A percentile
59. A coefficient of variation
60. A -score
61. In a sample of 50 customers, 21 held a current account, 22 held a savings account, 5 held an Investment account, and 2 held fixed deposit account. Find the probability that a customer does not hold a fixed deposit account.
62. 24/25
63. 29/50
64. 1/25
65. 27/50
66. When a financial analyst says that there is a 30% chance of the bank making profits this year, what type of probability is the person using?
67. Classical
68. Empirical
69. Relative
70. Subjective
71. A statistical graph of two quantitative variables is called \_\_\_\_\_\_\_\_\_\_\_\_\_
72. Pie Chart
73. Histogram
74. Bar Chart
75. Scatter Plot
76. The complement of guessing 5 correct answers on a 5-question true/false exam is
77. Guessing 5 incorrect answers
78. Guessing at least 1 incorrect answer
79. Guessing at least 1 correct answer
80. Guessing no incorrect answers
81. When two dice are rolled, how many events does the sample space consists of?
82. 6
83. 12
84. 36
85. 54

**SECTION B (60 MARKS)**

Answer **ANY THREE** questions from this section

**QUESTION 2**

1. Define the following terms;
2. Data
3. Median
4. Variance
5. Equally likely events *(8 marks)*
6. In a bank, there are 8 tellers and 5 customer care consultants; 7 tellers and 3 customer care consultants are female.

If a staff person is selected at random;

1. Find the sample space. *(3 marks)*
2. If the member of staff is selected at random, find the probability that the person is a consultant or female. *(3 marks)*
3. The data for the amount of profits made by a bank in a sample of 6 years are shown in millions of kwacha.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 11.2 | 11.9 | 12.0 | 12.8 | 13.4 | 14.3 |

Find the standard deviation for the amounts of profits. *(6 marks)*

**(Total 20 marks)**

**QUESTION 3**

1. List the **three** averages. *(3 marks)*
2. A survey found that 46% of cheques are referred to drawer at least once a week.

If three cheques are selected at random, find the probability that all three may have been referred to drawer at least once a week. *(4 marks)*

1. The table shows the average money spent by first-year banking students.

|  |  |
| --- | --- |
| Electronics | K 72,800 |
| Dorm decor | K 34,400 |
| Clothing | K 14,100 |
| Shoes | K 7,200 |

Draw an appropriate graph for the data. *(5 marks)*

1. A student analysed records from a local audit firm and presented the time, in days, the firm required to complete year-end audits for a sample of 60 clients in the following relative frequency distribution;

|  |  |
| --- | --- |
| **Audit Time (days)** | **Relative Frequency** |
| 10 – 14 | 0.20 |
| 15 – 19 | 0.40 |
| 20 – 24 | 0.25 |
| 25 – 29 | 0.10 |
| 30 – 34 | 0.05 |

Construct a frequency distribution for the data showing class boundaries, frequencies, class midpoints and cumulative less-than relative frequencies.

*(8 marks)* **(Total 20 marks)**

**QUESTION 4**

1. Distinguish a population from a sample, giving examples of each. *(4 marks)*

1. Explain the process of statistical analysis in management decision making using a diagram. *(6 marks)*
2. The data shown here represent the number of new accounts that were opened by 30 selected customer relations officers in a week.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 12 | 17 | 12 | 14 | 16 | 18 |
| 16 | 18 | 12 | 16 | 17 | 15 |
| 15 | 16 | 12 | 15 | 16 | 16 |
| 12 | 14 | 15 | 12 | 15 | 15 |
| 19 | 13 | 16 | 18 | 16 | 14 |

Construct a frequency distribution, and analyze the distribution. *(5 marks)*

1. The mean of the number of loans taken over a 3-month period is 87, and the standard deviation is 5. The mean loans amount is K52,250, and the standard deviation is K7,730.

Compare the variations of the two. *(5 marks)*

**(Total 20 marks)**

**QUESTION 5**

* 1. A study on the number of absenteeism (x) and the final grades (y) of seven randomly selected students from a statistics class are shown here.

|  |  |  |
| --- | --- | --- |
| **Student** | **Number of Absenteeism** | **Final Grade (%)** |
| A | 6 | 82 |
| B | 2 | 86 |
| C | 15 | 43 |
| D | 9 | 74 |
| E | 12 | 58 |
| F | 5 | 90 |
| G | 8 | 78 |
|  |  |  |

Construct a scatter plot for the data obtained in a study on the number of absenteeism and the final grades obtained. Comment on scatter plot. *(5 marks)*

* 1. Compute the value of the correlation coefficient for the data obtained in the study of the number of absenteeism and the final grade of the seven students in the statistics class given in question “a”. Comment on value of correlation coefficient obtained.  *(8 marks)*
  2. Find the equation of the regression line for the data obtained in the study of the number of absenteeism and the final grade of the seven students in the statistics class given, and graph the line on the scatter plot of the data. *(5 marks)*
  3. Use the equation of the regression line to predict the grade of a student that had 10 absenteeism. *(2 marks)*

**(Total 20 marks)**

**QUESTION 6**

* 1. What is the main advantage of graphing data? *(2 marks)*
  2. State the difference between a histogram and a bar chart giving data types for which one is used. *(4 marks)*

* 1. Give any **four** sampling techniques. *(4 marks)*
  2. The frequency distribution below gives the time taken by 31 tellers to complete balancing at the end of business day.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Time *t(min)* |  |  |  |  |  |
| Frequency | 4 | 12 | 8 | 4 | 3 |

1. Use the data to construct a fully labelled frequency polygon. *(4 marks)*
2. Interpret your results.  *(2 marks)*
3. A bank survey found that 53% of the customers had a savings account. Of these customers, 27% also had a fixed deposit account.

**Required:**

If a customer is selected at random, find the probability that the customer has both savings and fixed deposit account with the bank. *(4 marks)*

**(Total 20 marks)**

**END OF EXAMINATION PAPER**