AFRICA UNIVERSITY

COLLEGE OF BUSINESS AND MANAGEMENT SCIENCES

NMEC 103: STATISTICS FOR ECONOMICS

END OF SEMESTER EXAMINATIONS

NOVEMBER 2024

LECTURER: MR G. MANDEWO

TIME: 3 HOURS

INSTRUCTIONS

1. This paper contains **Six** questions.

2. Answer **Four** questions.

3. Start each question on a new page.

QUESTION 1

(a)Make a clear distinction between

(i)A population and a sample **[2 marks]**

(ii)Primary and secondary source of data **[2 marks]**

(iii) Arithmetic mean and geometric mean **[2 marks]**

(b) Using the following information construct a bar graph **[3 marks]**

Specialisation	Enrolment
Economics	5
Accounting	15
CIS	10
Management	35
Marketing	20

(c) Given the following information about how four students shared some funds

Grace 12 Agnes 18 Kundai 8 Samuel 20

Develop a pie chart using this information. **[3 marks]**

(d) Determine the average and draw a line graph **[3 marks]**

Class	Frequency
0 to less than 4	7
4 to less than 8	8
8 to less than 12	11
12 to less than 16	15

(e)You are given the following distribution of student marks after an in class test

Table 1. Student marks

Marks	No of students
20<30	7
30<40	12
40<50	8
50<60	3
60<70	2

i) The mean mark. **[3 marks]**

ii) The modal mark **[1 marks]**

iii) The median mark **[3 marks]**
iv) The standard deviation. **[3 marks]**

QUESTION 2

a. At a children's home, the matron wanted to know the average number of soap tablets used by 25 children per year. The sample mean was found to be 170 tablets and the standard deviation of 22 tablets.

i. Using 95% confidence interval, estimate the actual mean tablets used by each child and comment. **[5 marks]**

ii. What can we say about the mean at 90% confidence interval? **[5 marks]**

b. Classify the following examples of data as ordinal, nominal, interval or ratio. Justify your classification.

i. Temperature of a patient; **[5 marks]**

ii. Brand of a phone **[5 marks]**

iii. Students' examination marks **[5 marks]**

QUESTION 3

(a)The Grain Marketing Board carried out a survey on soya bean yield. Thirty farmers were interviewed and their yield per hectare in tones is recorded below

36 39 49 45 25 34 50 31 40 48 42 35 30 46 38
39 44 52 41 47 35 41 61 53 28 46 54 55 60 27

Required

i. Construct a frequency distribution using class intervals **[5 marks]**
ii. Draw the less than ogive curve and approximate the median yield. **[5 marks]**
iii. Draw a frequency histogram and approximate the modal yield. **[5 marks]**
iv. Using data from the frequency table in estimate the average soya bean yield per hectare. **[5 marks]**
v. Estimate the median yield. **[5 marks]**

QUESTION 4

a) The data in Table 2 shows how sales respond to number of advertisement flights in a newspaper;

Table 2. Sales response to advertisement

No of newspaper advertisements	5	4	6	6	5	6	4	5
Sales	42	38	35	40	44	38	45	42

i) State and justify your apriori expectations **[5 marks]**
ii) Draw a scatter diagram and insert the regression line **[5 marks]**

iii) Determine the independent and dependent variables. **[3 marks]**
iv) Estimate the linear regression equation of sales on advertisement **[5 marks]**
v) Interpret the slope of regression line. **[2 marks]**
vi) Find the sales value if there are 8 advertisements. **[2 marks]**
vii) Calculate Pearson's correlation coefficient (r) and interpret it. **[3 marks]**

QUESTION 5

The works department is estimating the cost of constructing a perimeter wall. The works manager believes that the standard perimeter wall should be 25 metres high. To avoid confusion, the works director requested the section to carry out a research and 30 walls were sampled for the study. The average wall height was found to be 22 metres with a sample standard deviation of 8 metres.

(a) Explain the difference between null hypothesis and alternative hypothesis **[5 marks]**
(b) Under what circumstances can Z distribution tables be used instead of t distribution tables? **[5 marks]**
(c) Test the works manager's hypothesis at 1% level of significance. **[5 marks]**
(d) Can we come up with the same conclusion at 5% level of significance? **[5 marks]**
(e) Test the hypothesis at 1% significance level that the average height is at least 25 metres. **[5 marks]**

QUESTION 6

Measures of central tendencies and measures of dispersion would assist a statistician to determine the subtle patterns in the data. You are required to use a data set of your own choice and explore all concepts. You are further required to show how the concepts are related. **[25 Marks]**

END OF EXAMINATION