



“Investing in Africa’s Future”

COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE

NCIS 208: APPLIED STATISTICS

END OF FIRST SEMESTER EXAMINATIONS

NOVEMBER 2022

LECTURER: MR A.C MUZENDA

DURATION: 3 HOURS

INSTRUCTIONS

Answer all Questions in Section A and **any three questions from Section B**
Total possible mark is 100

Start **each** question on a new page in your answer Booklet.
The marks allocated to **each** question are shown at the end of the section.

Candidates can use scientific calculators.
Candidates must be issued with statistical booklets.
Graph papers must be used

SECTION A: ANSWER ALL QUESTIONS

QUESTION 1

- a. The following data gives words per minute typed by a sample of 40 pupils in a secretarial course:

15 35 43 51 25 35 43 52 54 45 27 35 38
45 28 55 38 46 30 46 32 31 39 57 40 47
58 40 30 56 60 47 41 48 65 31 34 70 50
44

Required:

Calculate:

- i. Mean [3]
- ii. Median [3]
- iii. Lower quartile [3]
- iv. Upper quartile [3]
- v. Inter-quartile range [3]

- c. The training manager of a Zimbabwean company that assembles and exports pool pumps wants to know if there is a link between the number of hours spent by assembly workers in training and their productivity on the job. A random sample of 10 assembly workers was selected and their performance evaluated.

Training hours	20	36	20	38	40	33	32	28	40	24
Output	40	70	44	56	60	48	62	54	63	38

Required:

- i. Construct a scatter plot of the sample data and comment on the relationship between hours of training and output.
[7]
- ii. Calculate a simple regression line, using the method of least squares. [8]
- iii. Calculate the co-efficient of determination between training hours received and worker output. Interpret its meaning and advise the training manager. [10]

SECTION B

Answer any three questions

QUESTION 2

- a. Find the probability using the z-tables that:
- i. $P(0 < Z < 1.46)$ [5]
 - ii. $P(-2.3 < Z < 0)$ [5]
- b. The time taken to install a DSTV satellite dish is found to be normally distributed with a mean equal to 45 minutes and a standard deviation of 8 minutes. For a new installation what is the probability that:
- i. It will take between 45 minutes and 51 minutes. [5]
 - ii. It will take between 44 minutes and 49 minutes. [5]

QUESTION 3

- a. The service of a BMW car at a garage is found to be normally distributed with mean of 70 minutes and standard deviation of 9 minutes. If a customer brings her BMW car in for service:
- What is the probability that the service will take:
- i. Exactly 1 hour? [5]
 - ii. More than 1 hour [5]
 - iii. Between one and two hours? [5]
- b. Explain the Simple random sampling method. [5]

QUESTION 4

- a. A product consists of two components. The product fails when either or both components fail. There is a 5% chance that component 1 will fail and 10% chance that component 2 will fail. The components can fail independently of each other.

Required:

- i. What is the probability that the product will fail? (Use a probability tree to calculate the probability that the product will fail). [8]
- b.

Hourly Wages \$	3.50 <3.60	3.60<3.70	3.70<3.80	3.80<3.90	3.90<4.00	4.00<4.10	4.10<4.20	4.20<4.30
Frequency	1	2	2	4	5	6	3	2

Required:

- i. Construct a histogram for the data and use it to estimate the mode. [6]
- ii. Construct a greater Ogive for the data. [6]

QUESTION 5

a. A survey of first year University students sought to establish any association between choice of degree and sex .Assuming only two degrees were on offer , the following results were obtained.

		Degree Programme	
Sex		Computer Science	Accounting
Male		117	63
Female		24	56

Use a 5% level of significance to test whether there is an association between sex and choice of degree programme. [10]

b. A company which supplies eggs receives an average six orders per day. What is the probability that;

- i. No orders will be received in a given day [3]
- ii. Exactly 2 orders will be received in half a day [3]
- iii. At least 2 orders will be received in a given day [4]

END OF THE PAPER
