GWANDA STATE UNIVERSITY

FACULTY OF BUSINESS SCIENCE AND MANAGEMENT

DEPARTMENTS OF ACCOUNTING AND MARKETING

QUANTITATIVE ANALYSIS OF BUSINESS I

BAC 1102/BMA 1106

Main Examination Paper

APRIL 2025

This examination paper consists of 3 printed pages

Time Allowed: **3 hours**

Total Marks: **100**

INSTRUCTIONS TO CANDIDATES

Candidates should answer **ALL** questions in section A and **THREE** questions in section B.

ADDITIONAL REQUIREMENTS

Scientific calculator

Graph papers

Statistical Tables

SECTION A (40 marks)

Answer ALL questions from this section.

A1. Define the following terms

(i) Discrete data [2]

(ii) Sample [2]

(iii) Dependent variable [2]

A2. The distance (in km) travelled by messengers in doing their daily routines in a big city are as follows;
26, 31, 21, 13, 15, 20, 9, 18, 12, 34, 29, 24
Calculate

(i) the arithmetic and the geometric means ($\overline{x}$) [1,2]

(ii) sample variance and standard deviation. [3,1]

A3. (i) Differentiate between descriptive and inferential statistics. [2]

(ii) Critique on the strengths and weaknesses of making decisions based on the mean [3]

A4. The financial manager of an investment firm will approve a new investment strategy if its average return is at least 3.2% per annum. Suppose that a random sample of 13 investment portfolios using the new strategy had an average return of 2.89% with a standard deviation of 0.4%. Advise the manager on whether the new investment strategy should be approved. Use a 95% confidence level. [4]

A5. The data below shows the monthly sales in dollars ($) for Ntozonke Supermarket on randomly selected days in the first quarter of 2025.

96 171 202 178 147 102 153 197 127 82
157 185 90 116 172 111 148 213 130 165
141 149 206 175 123 128 144 168 109 167
95 163 150 154 130 143 187 166 139 149

(i) Present the above information using a frequency distribution table [6]

(ii) Using the frequency distribution table, calculate

(a) the median sales [4]

(b) the modal sales [4]

(c) the 65^{th} percentile [4]

SECTION B (60 marks)
Answer ANY THREE questions from this section.

B6. (i) A firm's accounts receivable department processes an average of 6 payment invoices per week. Assuming that the number of invoices processed follows a Poisson distribution, calculate

(a) the probability that fewer than 3 invoices will be processed in any given week [5]

(b) the probability that the department will process exactly four invoices in a given fortnight [4]

(c) the probability that the department will process exactly 5 invoices in a given hour, given that the office operates from Monday to Friday, 8 hours a day. [5]

(ii) An accounting firm conducted a survey on payment methods used by clients. Out of a random sample of 160 clients, 68 clients paid for their services in cash, while the remaining clients paid via bank transfer. Construct a 95% confidence interval for the actual percentage of clients who pay in cash for the firm's services. [6]

B7. A financial analyst at an accounting firm recorded the weekly revenue (in thousand dollars) from client service fees over the past 30 weeks. The data is summarized in the table below.

Revenue ($000)	12-17	18-23	24-29	30-35	36-41	42-47	48-53
Frequency	3	2	7	8	5	4	1

Calculate

(i) the mean absolute deviation of weekly revenue [5]

(ii) the lower and upper quartiles [6]

(iii) the 60^{th} percentile of the revenue [3]

(iv) Karl Pearson's coefficient of skewness and comment on your results [6]

B8. (i) After advertising our product, 30% of the population showed an interest in the product. A random sample of 10 customers is taken, find the probability that more than 3 customers will like the product [5]

(ii) The masses of packages from a particular machine are normally distributed with a mean of 200 grammes and a standard deviation of 2 grammes. Find the probability that a randomly selected package from the machine weighs

(a) less than $199g$ [3]

(b) more than $202g$ [3]

(c) between 197.5 and 199.5 [5]

(iii) If $X \sim N(5.2; 0.042^2)$. Find the 95% confidence interval for μ [4]

B9. The manager of a clothing shop did a small survey on the amount a woman spent on clothes and her age. The results of this research are tabulated below

Woman's age ($x - years$)	18	21	36	45	23	53	25	37	30	32
Expenditure on clothes ($\$y$)	330	300	180	120	310	150	250	150	245	190

(i) Present the above information using a scatter diagram [5]

(ii) Find the equation of the regression line, y on x [5]

(iii) Fit your equation of the regression line on your scatter plot. [3]

(iv) Use your fitted line to estimate the amount likely to be spent by a 50 year old woman [2]

(v) Find the product moment correlation coefficient and comment on the relationship that exist between woman's age and expenditure on clothes. [5]

END OF QUESTION PAPER

If you fail at first, try two more times so that your failure becomes statistically significant