



ZIMBABWE

**MINISTRY OF HIGHER AND TERTIARY EDUCATION,
INNOVATION, SCIENCE AND TECHNOLOGY
DEVELOPMENT**

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL DIPLOMA

IN

BUSINESS AND MANAGEMENT STUDIES

SUBJECT: Quantitative Techniques

**PAPER NO: 500/15/S06
500/22/S06**

DURATION: 3 Hours

JUNE 2026 EXAMINATION

REQUIREMENTS

1. Non – programmable calculator
2. Formular booklet and tables
3. Graph paper.

INSTRUCTIONS TO INVIGILATOR

1. Attempt five (5) questions.
2. Show all working.
3. All questions carry equal marks.

QUESTION 1

Gross profits from furniture sales from 100 shops are as shown below.

Gross profit (millions)	Number of shops
$10 \leq x < 20$	12
$20 \leq x < 30$	23
$30 \leq x < 40$	35
$40 \leq x < 50$	15
$50 \leq x < 60$	9
$60 \leq x < 100$	6

Calculate

- a) Mean (3 marks)
- b) Median (4 marks)
- c) Mode (4 marks)
- d) Semi-interquartile range (5 marks)
- e) Standard deviation for the profits made (4 marks)

QUESTION 2

- a) The probability of throwing a strike in a bowling game is $\frac{1}{5}$. Six bowlers were selected at random. What is the probability that:
 - i) All will throw strikes (3 marks)
 - ii) At least three (3) will not throw a strike (4 marks)
 - iii) None will throw a strike (2 marks)
- b) State any four (4) characteristics of the Normal distribution. (4 marks)
- c) A bus company has an average of 12 breakdowns per week. What is the probability that there are:
 - i) No breakdowns in a week (3 marks)
 - ii) More than 2 breakdowns in 2 weeks (4 marks)

QUESTION 3

The following data shows the number of garments and the amount of cloth required.

Number of garments	Cloth available in metres
45	25
28	16
34	20
42	28
34	19
30	17
42	22
39	20
24	14
32	17
20	6

- State the dependent and independent variables (2 marks)
- Fit a regression line using the least squares method (5 marks)
- Estimate the number of garments made when the cloth available is 20m. (2 marks)
- Draw a scatter plot and comment. (5 marks)
- Calculate the correlation coefficient between cloth available and the number of garments made. (6 marks)

QUESTION 4

- Determine the coordinates and nature of the turning points on the curve represented by the function $y = x^3 - 7.5x^2 + 18x + 6$ (10 marks)

- A company is opening a new office and identifies the main activities and dependence as follows:

Activity	Preceding Activity
1	-
2	-
3	1
4	1
5	4
6	2
7	3;5;6

Draw a network diagram for this project.

(10 marks)

PAPER NO: 500/15/S06 & 500/22/S06 - QUANTITATIVE TECHNIQUES

QUESTION 5

The following data gives the amount of money charged per 2kg sugar by different shops. Ten (10) shops were selected at random as follows:

2,58; 2,35; 2,30; 2,50; 3,00; 2,15; 2,96; 2,57; 2,55; 2,60

Calculate

- Mean (3 marks)
- Standard deviation (4 marks)
- Find the 95% confidence interval for the mean price of 2kg sugar (6 marks)
- Test at 5% level of significance whether the mean price is greater than \$2.50 given that the population standard deviation is 0.25. (7 marks)

QUESTION 6

The number of visitors to a resort site were recorded over four years as follows:-

Year	Summer	Autumn	Winter	Spring
2014	3000	2000	1000	1500
2015	2900	2200	900	1200
2016	2500	2000	980	1100
2017	2100	1980	700	900

- Obtain a 3-point moving average of the number of visitors (10 marks)
- Determine the trend line of the visitors (8 marks)
- Predict the number of visitors in winter 2018 (2 marks)

QUESTION 7

The following data shows the price of each item and the average quantities purchased by an organisation each week.

Item	2015		2016	
	Quantity	Price	Quantity	Price
A	70	30	90	40
B	40	60	50	55
C	50	55	30	80
D	110	20.5	160	20.5
E	30	70	20	100

Calculate Fisher's price index (10 marks)

- A debt of \$22500 is to be repaid through amortisation over 2 years. The rate of interest is 4% per annum compounded quarterly
 - Calculate the quarterly payment applicable (4 marks)
 - Draw up the amortisation schedule (6 marks)

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