



**REFORMED CHURCH UNIVERSITY**

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**FACULTY OF COMMERCE**

**BACHELOR OF COMMERCE HONOURS DEGREE IN  
BUSINESS MANAGEMENT**

**QUANTITATIVE ANALYSIS FOR BUSINESS**

**HBUM 112**

**PART 1 SEMESTER 1 EXAMINATION**

**TOTAL MARKS [100]**

**DATE: JUNE 2024**

**Time: 3 Hours**

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**INSTRUCTIONS**

- 1 This paper has *six (6)* questions
  - 2 Answer Question One (*1*) and any other *three (3)*
  - 3 Each question carries *25 marks*
  - 4 Start each question on a new page
  - 5 *NB Mathematical Tables must be provided.*
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1. The following data below shows the monthly sales for a sample of 100 airtime agents of Econet:

Sales (in USDs)	Number of Agents
100-150	36
151-200	24
201-250	18
251-300	13
300-350	6
351-400	3

- a) Construct a More than Ogive for the distribution [5]
- b) Compute the following:
- Mean and comment [2]
  - Median and comment [3]
  - Mode and comment [3]
  - Variance [3]
  - Standard deviation [2]
  - Semi- interquartile range [2]
  - Coefficient of the variation of the distribution [2]
  - Degree of skewedness. Comment on the findings. [3]

2. A sample of 10 brick molders were selected and their production output for bricks per random hour were recorded as follows:

Standard Bricks	650	660	760	710	650	570	730	720	680	700
Kimberley Bricks	710	650	700	720	700	620	700	740	720	680

- a) Construct a Stem and Leaf plot for the Standard and Kimberley bricks [4]
- b) Construct a Box and Whisker for the Standard bricks. Comment on skewedness [6]
- c) Calculate the three (3) measures of Central tendency for Kimberley bricks [6]
- d) Compute, compare and comment on the Standard Deviation for the two (2) brick types [9]

3. The forecasted profit (in USD) for Osaine Chemicals in December 2024 are believed to follow the probability distribution shown below.

X	(\$12,000)	(\$8,000)	0	\$9,000	\$6,800	7,500
P(X=x)	0.03	0.26	0.15	$p$	0.24	0.1

- a) Determine the value of  $p$ . [2]
- b) Find the probability that Osaine Chemicals:
  - i) Make loss [3]
  - ii) Realize profit of at least \$7,000 [3]
  - iii) Realize a profit of at most \$7,500 [3]
  - iv) Break even [1]
  - v) Make a loss of at most \$8,000 or at least breaks-even [2]
- c) Find
  - i) the expected earnings of the business [4]
  - ii) standard deviation of profits for the business [5]
- d) Is the venture likely to be successful? Explain. [2]

4. San Siro specializes on selling liquor and wishes to research on the effect of temperature on liquor sales during the summer season. A random sample of 12 days was selected with the results as follows:

Temperature ( $^{\circ}\text{C}$ )	Sales (\$)
19	162
35	380
23	220
28	268
32	312
32	325
22	196
27	235
32	295
24	200
36	345
25	215

- State the dependent and independent variables [2]
- Plot a scatter diagram and comment [3]
- Using the method of least squares, estimate the regression equation and comment [4]
- Interpret the meaning of the slope  $b$  calculated in part c) above [1]
- Predict the sales for a day in which temperature is  $31^{\circ}\text{C}$  [3]
- Calculate the correlation coefficient,  $r$  and integrate its meaning [4]
- Calculate the coefficient of the determination,  $r^2$  and interpret its meaning. [4]
- Calculate the Spearman's rank of correlation coefficient,  $r$  and its meaning [4]

5. A company buys four products with the following characteristics

Item	Number of units bought		Price paid per unit	
	Year 0	Year 1	Year 0	Year 1
A	145	170	8	10
B	170	175	25	30
C	190	200	20	35
D	210	160	30	40

- Find the simple price index for product A and interpret its meaning [2]
  - Construct a simple quantity index for B and interpret its meaning [2]
  - Calculate the simple value index (SVI) for item C and interpret its meaning [2]
  - Calculate the unweighted aggregate price index (UAPI) and interpret it. [4]
  - Calculate Paasche Indices (PPI & PQI) and interpret [6]
  - Calculate Laspyere indices and interpret [6]
  - Calculate Fisher Price Index and interpret [3]
6. a) The following data shows three different airlines and the number of delayed or on-time flights at the Robert Mugabe International Airport:

Airline	Flight Status	
	Delayed	On - Time
Air Zimbabwe	118	850
Qatar Airways	110	1400
Air Tanzania	80	900

Use a 5% level of significance to test whether there is an association between flight status (delayed or on-time) and the airline.

[15]

b) Byword Motors places a semi-annual order of 5000 units of tyres at a price of \$200 per unit. Its carrying cost is 13.5% and the order cost is \$110 per order.

i. Calculate the economic order quantity [7]

How many orders need to be placed [3]

**END OF PAPER**