



REFORMED CHURCH UNIVERSITY

FACULTY OF COMMERCE

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

QUANTITATIVE ANALYSIS FOR BUSINESS

HPMG 120

PART 1 SEMESTER 2

Total Marks [100]

DATE: JUNE 2024

Time: 3 Hours

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

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:
- i. Mean and comment [2]
 - ii. Median and comment [3]
 - iii. Mode and comment [3]
 - iv. Variance [3]
 - v. Standard deviation [2]
 - vi. Semi- interquartile range [2]
 - vii. Coefficient of the variation of the distribution [2]
 - viii. 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°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]

ii. How many orders need to be placed [3]

END OF PAPER