REFORMED CHURCH UNIVERSITY

FACULTY OF COMMERCE

BACHELOR OF COMMERCE HONOURS DEGREE IN LOGISTICS & SUPPLY CHAIN MANAGEMENT

QUANTITATIVE ANALYSIS FOR BUSINESS

HLSM 119

PART 1 SEMESTER 2 EXAMINATION

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
5. *NB Mathematical Tables must be provided*.

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 (°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

a) State the dependent and independent variables   [2]
b) Plot a scatter diagram and comment   [3]
c) Using the method of least squares, estimate the regression equation and comment [4]
d) Interpret the meaning of the slope **b** calculated in part c) above   [1]
e) Predict the sales for a day in which temperature is 31 °C [3]
f) Calculate the correlation coefficient, r and integrate its meaning   [4]
g) Calculate the coefficient of the determination, r^2 and interpret its meaning. [4]
h) 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

a) Find the simple price index for product A and interpret its meaning [2]

b) Construct a simple quantity index for B and interpret its meaning [2]

c) Calculate the simple value index (SVI) for item C and interpret its meaning [2]

d) Calculate the unweighted aggregate price index (UAPI) and interpret it. [4]

e) Calculate Paasche Indices (PPI & PQI) and interpret [6]

f) Calculate Laspyere indices and interpret [6]

g) 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