



**REFORMED CHURCH UNIVERSITY**

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**FACULTY OF COMMERCE**

**BACHELOR OF COMMERCE HONOURS DEGREE IN HUMAN  
RESOURCES, LABOUR AND INDUSTRIAL RELATIONS**

**QUANTITATIVE METHODS**

**HHRM 413**

**PART 4 SEMESTER 2 EXAMINATION**

**TOTAL MARKS [100]**

**DATE: DECEMBER 2022**

**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

1. The distribution of hourly earnings of employees of a company are as follows

Hourly earnings \$	Number of Employees
4.70 – 4.90	6
4.90 - 5.10	31
5.10 – 5.30	29
5.30 – 5.50	19
5.50 – 5.70	15
5.70 - 5.90	10

a) Calculate the

- i) Mean [3]
- ii) Median [3]
- iii) Mode [3]
- iv) Variance [3]
- v) Standard deviation [2]
- vi) Interquartile deviation [3]

b) Find the coefficient of the variation of the distribution. Comment on the distribution[4]

c) Find the degree of skewedness of the distribution. Comment on the findings.[4]

2. The mass y grams of a chemical is related to the time, x minutes for which the chemical reaction has been taking place as shown in the table,

Time, x minutes	5	7	12	16	20
Mass, y grams	4	12	18	21	24

- (a) Show the data on a scatter plot and comment on the distribution (5)
- (b) Estimate the regression equation using the least squares method (8)
- (c) Determine the Pearson's correlation coefficient and interpret it (6)
- (d) Calculate the coefficient of determination of the data. Appraise your answer. (6)

3. The following data show daily sales (in dollars) of a street vendor over 25 randomly selected days.

52 43 54 45 34 21 18 14 9 40 39 36 11  
6 32 15 29 19 10 15 26 17 27 8 28

(a) Show the data on a stem and leaf display (3)

(b) Find the following summary measures

(i) Mode (1)

(ii) Mean (2)

(iii) Median (3)

(iv) Lower quartile (3)

(v) Upper quartile (3)

(vi) The standard deviation (5)

(d) Draw a box and plot of the data and comment on the distribution of the sales (5)

4. (a) A deposit of \$3 000 grew to \$3 750 in 5 years' time. Determine the simple interest rate per annum. (6)

(b) An amount of \$10 000 earns 10% per annum interest for 4 years.

Determine the amount realised at the end of the 4 years if interest is:

(i) Compounded annually (3)

(ii) Compounded semi-annually (3)

(i) Compounded monthly (3)

(ii) Compounded weekly (4)

(c) Assuming that ABC Corporation has a choice of buying a machine for \$10 000 or paying \$3 000 for 5 years for the same machine, If the opportunity cost is 12% per annum.



Advise ABC on which alternative is better.

(6)

5. A company buys five products with the following characteristics

Item	Number of units bought		Price paid per unit	
	Year 0	Year 1	Year 0	Year 1
A	120	141	9	10
B	149	163	21	23
C	173	182	26	27
D	194	103	31	33

- Find the simple quantity index for product A. [3]
- Construct a simple quantity index for A [3]
- Calculate the simple value index for item D. [4]
- Calculate the unweighted aggregate quantity index and interpret it. [4]
- Calculate Paasche quantity index and interpret it. [5]
- Calculate Laspyere index of products using 0 as the base year. [6]

6. A luxury passenger liner has 500 passengers on board whose ages are normally distributed around a mean of 60 years with a standard deviation of 12 years.

- How many of the passengers are
  - Between 45 and 75 years old? [3]
  - Older than 78 years? [3]
  - Younger than 45 years [3]
  - What is the minimum age of the oldest 20% of the passengers? [3]

Delta Beverages makes a product with a selling price of \$20 per unit and variable costs of \$12 per unit. The fixed costs for the period are \$50,000.

- Calculate the Break Even Point in output (2 marks)
- Compute BEP in sales (2 marks)
- What is the required output level to make a target profit of \$15,000? (2 marks)

- viii. d) Draw and fully label the break-even chart and graph for the business (5 marks)
- ix. d) Given that sales amount to 11'000 units, calculate the margin of safety (2 marks)

*End of Paper*