



**REFORMED CHURCH UNIVERSITY**

---

**FACULTY OF COMMERCE**

**Bachelor of Commerce Honours Degree in Logistics and Supply**

**Chain Management**

**Business Mathematics**

**HLSM 108**

**Part 1 Semester 2 Examination**

**Total Marks [100]**

**Date: December 2020**

**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 shows daily sales (in dollars) of sweets by a vendor over 15 randomly selected days.

36 41 28 53 28  
42 21 28 39 20  
50 19 52 15 8

Find the

- (a) mean (3)
  - (b) mode (2)
  - (c) median (3)
  - (d) standard deviation (5)
  - (e) Produce a stem and leaf diagram for the sales. (5)
  - (f) Produce a box plot for the sales and comment on the distribution of sales. (7)
2. (a) On average the number of cars that pass through a police check point is 6.8 in a ten minute period.

What is the probability that

- (i) Fewer than two cars pass through the check point in the ten minute period(4)
  - (ii) Exactly three cars pass through the check point in the ten minute period(4)
  - (iii) No car will pass through the check point within a five minute period (4)
  - (iv) More than four cars will pass through in thirty minute period (5)
- (b) Of the 120 patients admitted to a hospital, twenty five were tested for levels of blood sugar with the following results:

87 51 83 67 78 77 69 76 68 85 84 85 70  
68 80 74 79 66 85 73 104 78 81 77 75

Construct a box plot for the data and comment on its skewness (8)

3. (a) Explain the benefits a Business Manager derives from the knowledge of Business Mathematics. (10)

(b) Explain how the following are used in business management:

- i. Linear programming
- ii. Linear equations
- iii. Scatter plot
- iv. Regression equation
- v. Descriptive statistics (15)

4. Solve the following equations

(a)  $x^2 + 5x + 6 = 0$  (3)

(b)  $3x^2 + x - 2 = 0$  (5)

(c). Given the variables:  $Q_s$  - quantity supplied

$Q_d$  - quantity demanded

P - price

Calculate the equilibrium price for the potato market by using the following supply and demand equation:

$$Q_s = 100 + 5p$$

$$Q_d = 450 - 2p \quad (6)$$

(d). Use the information in the table below to answer the following questions:

X	10	20	30	40	50	60
Frequency(f)	3	9	14	10	6	4

Calculate

- i) Mean (3)
- ii) Variance (3)
- iii) Standard deviation (5)

5. A shop sells home computers. The number of computers sold in each of 8 successive years are as follows:

Year(x)	1	2	3	4	5	6	7	8
Sales(y)	10	30	70	140	170	180	192	199

- (a) Draw a scatter plot of the data and comment on the relationship shown. (8)
- (b) Estimate the regression equation (7)
- (c) Interpret the slope coefficient of regression equation. (3)
- (d) Find the coefficient of determination and comment on its magnitude. (7)
6. (a) A firm sold furniture set for \$6 500 at a profit of 10%. Calculate the cost price of furniture. (7)
- (b) A deposit of \$3 000 grew to \$3 750 in 5 years' time. Determine the simple interest rate per annum. (6)
- (c) 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)
- (iii) Compounded monthly (3)
- (iv) Compounded weekly (3)

*End of Paper*

5. A shop sells home computers. The number of computers sold in each of 8 successive years are as follows:

Year(x)	1	2	3	4	5	6	7	8
Sales(y)	10	30	70	140	170	180	192	199

- (a) Draw a scatter plot of the data and comment on the relationship shown. (8)
- (b) Estimate the regression equation (7)
- (c) Interpret the slope coefficient of regression equation. (3)
- (d) Find the coefficient of determination and comment on its magnitude. (7)
6. (a) A firm sold furniture set for \$6 500 at a profit of 10%. Calculate the cost price of furniture. (7)
- (b) A deposit of \$3 000 grew to \$3 750 in 5 years' time. Determine the simple interest rate per annum. (6)
- (c) 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)
- (iii) Compounded monthly (3)
- (iv) Compounded weekly (3)

***End of Paper***