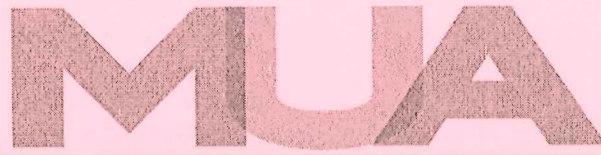


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**UNDERGRADUATE UNIVERSITY EXAMINATIONS**  
**SCHOOL OF MANAGEMENT AND LEADERSHIP**  
**DEGREE OF BACHELOR OF MANAGEMENT AND LEADERSHIP/**  
**BACHELOR OF COMMERCE/ BACHELOR OF ARTS IN**  
**DEVELOPMENT STUDIES**

**BML 103/ BCM 112/BDS 109 : BUSINESS MATHEMATICS / STATISTICS FOR DEVELOPMENT STUDIES**

**DATE: 6<sup>TH</sup> DECEMBER, 2021**

**DURATION: 2 HOURS**

**MAXIMUM MARKS: 70**

**INSTRUCTIONS:**

1. Write your registration number on the answer booklet.
2. **DO NOT** write on this question paper.
3. This paper contains **SIX (6)** questions.
4. Question **ONE** is compulsory.
5. Answer any other **THREE** questions.
6. Question **ONE** carries **25 MARKS** and the rest carry **15 MARKS** each.
7. **Write all your answers in the Examination answer booklet provided.**

|         | 2019   |          | 2020   |          |
|---------|--------|----------|--------|----------|
| PRODUCE | PRICE  | QUANTITY | PRICE  | QUANTITY |
| X       | 10,000 | 120      | 9,800  | 115      |
| Y       | 9,500  | 110      | 10,200 | 120      |
| Z       | 11,000 | 118      | 11,300 | 130      |

Use Fishers 'ideal' price indices to advice the company on their performance

(10 Marks)

b) Draw diagrams showing positive and negative skewness

(5 Marks)

#### QUESTION FOUR

The following data was obtained from students who did an opening at St. Scholastic School.

| Marks    | No. of Students (F) |
|----------|---------------------|
| 10 - 20  | 11                  |
| 20 - 30  | 18                  |
| 30 - 40  | 22                  |
| 40 - 50  | 29                  |
| 50 - 60  | 38                  |
| 60 - 70  | 32                  |
| 70 - 80  | 21                  |
| 80 - 90  | 15                  |
| 90 - 100 | 9                   |

**Required:**

- Calculate the mean (4 Marks)
- Determine the standard deviation (9 Marks)
- Determine the coefficient of variance (2 Marks)

**FORMULAS**

$$\text{Mean} = \frac{\sum X}{n}$$

$$\text{Mean,} = \frac{\sum FX}{\sum F}$$

$$\text{Z-Formula} = \frac{\text{Mean Value}}{\text{standard deviation}}$$

$$\text{Mode} = L + \frac{F_1}{F_1 + F_2} \times i$$

or

$$\text{Mode} = L + \left( \frac{D_1}{D_1 + D_2} \right) \cdot c$$

$$\text{Median} = L + \frac{i}{F} (m - c)$$

or

$$\text{Median} = L + \left( \frac{\frac{N}{2} - F_{m-1}}{f_m} \right) \cdot c$$

$$\text{Variance} = \frac{\sum F(X - \text{mean})^2}{\sum F}$$

or

$$\text{Variance, } S^2 = \frac{\sum fx^2}{\sum f} - \bar{x}^2$$

$$\text{Standard deviation} = \sqrt{\frac{\sum F(x - \text{mean})^2}{\sum F}} \text{ or}$$

$$\text{Standard deviation, } S = \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2}$$

$$\text{CV} = \frac{\text{SD}}{\text{Mean}} \times 100$$

$$\text{SKp} = 3 \times \frac{(\text{mean} - \text{median})}{\text{Standard deviation}}$$

$$S = P(1 + r)^n$$

$$S = P(1 + r)^n$$

$$L_P = \frac{\sum q_0 p_n}{\sum q_0 p_0} \times 100$$

$$L_Q = \frac{\sum p_0 q_n}{\sum p_0 q_0} \times 100$$

$$P_P = \frac{\sum q_n p_n}{\sum q_n p_0} \times 100$$

$$P_Q = \frac{\sum p_n q_n}{\sum p_n q_0} \times 100$$

$$F_P = \sqrt{L_P \times P_P}$$

$$F_Q = \sqrt{L_Q \times P_Q}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$