



PAN AFRICA CHRISTIAN UNIVERSITY
YEAR ONE SEMESTER TWO EXAMINATION
MFT 601A: STATISTICS FOR RESEARCH IN MFT

Date: December 14th 2021

Time: 3 Hours

INSTRUCTIONS

- i. Answer question ONE and any other TWO questions.
- ii. Question one carries 20 marks and the rest carry 10 marks each.
- iii. Use of electronic computers and mathematical tables is permitted.
- iv. Use graph papers where necessary.

SECTION ONE

Question One (20 marks). Compulsory

1. The following were the scores obtained by a masters class in a statistics test:

49 63 59 44 49 51 62 37 30 49 45 52 50 42 54 40
32 57 41 42 56 44 46 63 44 40 50 46 53 48 37 57
46 53 68 36 56 37 66 43 40 43 51 59 42 52 46 48

- a) Make a grouped frequency distribution that should have tally marks and frequencies for each class interval. Use class size (i) = 5 and start with 30-34 as the lowest class interval.

(8 marks)

- b) Compute the:-

- i. Mean (2 marks)
- ii. Standard deviation. (2 marks)
- iii. Median. (2 marks).
- iv. Mode. (2 marks).

- v. 90th percentile, P_{90} (2 marks)
- vi. First Quartile, Q_1 (2 marks)

SECTION TWO. Answer any TWO questions from this section

Question 2 (10 marks)

A researcher conducts a study to investigate the relationship between cigarette smoking and illness. The number of cigarettes smoked daily and the number of days absent from work in the last year due to illness are determined for 12 individuals employed at the company where the researcher works. The scores are given in the following table.

Subject	Cigarettes smoked per day	No. of days absent from work per year
1.	0	1
2.	0	3
3.	0	8
4.	10	10
5.	13	4
6.	20	14
7.	27	5
8.	35	6
9.	35	12
10.	44	16
11.	53	10
12.	60	16

- a) Construct a scatter plot for these data. (2 marks)
- b) Calculate the value of Pearson correlation coefficient. (6 marks)
- c) Comment of your answer in (b) above? (2 marks)

Question 3. (10 marks)

- a) Using relevant examples state two (2) reasons why social scientists need to have knowledge of statistics?
(2 marks)
- b) State the four (4) levels of measurement (scale of measurement) and using examples, discuss their characteristics. (4 marks)

- c) State four (4) methods of acquiring knowledge? Briefly describe the limitations of each method. (4 marks)

Question 4. (10 marks)

- a) Distinguish between the following terms as used in statistics:

i. Population and sample (2 marks)

ii. Dependent and independent variables (2 marks)

- b) A sample of eggs from one day's production has mass in grams:

40 50 72 51 60 55 67 46 57 53 55 42 51 59 49 52 46 64 43 66 54 64 48 58 52. Draw a stem-leaf diagram using stems 4, 5, 6, 7. (6 marks)

Formulae

$$\bar{X} = \frac{\sum X}{N}$$

$$S = \sqrt{\frac{\sum (X_i - \bar{X})^2}{n-1}}$$

$$\text{Variance} = s^2 = \frac{\sum (x - \bar{x})^2}{n-1}$$

$$\text{Mdn} = L + \left(\frac{N/2 - cfb}{fw} \right) Ci$$

Where L = the exact lower limit of the class interval containing the median

N = total number of cases in the distribution

Cfb = cumulative frequency below the interval containing the Median.

fw = the frequency of scores within the interval containing the median.

Ci = class interval of the distribution.

$$r = \frac{\sum (X - \bar{X})(Y - \bar{Y})}{\sqrt{\sum (X - \bar{X})^2 \sum (Y - \bar{Y})^2}}$$

$$r = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$