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THE OPEN UNIVERSITY OF SRI LANKA

B.Sc. /B.Ed. Degree Programme, Continuing Education Programme

APPLIED MATHEMATICS-LEVEL 05

ADU5318 – Bio Statistics

No Book Test (NBT) 2017/2018

Date: - 05.01.2019 **Time: 2.30pm – 3.30pm**

Instructions

- This examination is of **One hour** duration.
- There are two parts to the question paper. Part *A* consists of 10 multiple choice questions. Each correct answer is given 5 marks. Part *B* consists of a structured essay question. Fifty (50) marks are allocated for this question distributed as indicated.
- Answer **All** questions. At the end of the examination, handover Part *A* with correct answers underlined along with the answers to Part *B*.

Part *A*

Underline the most suitable answer from the choices given.

1. The measure that has 50% of the observations smaller than or equal to its value is:
   a) Sample mean
   b) Sample median
   c) First quartile
   d) Mode

2. Which of the following is not a measure of dispersion?
   a) Mean absolute deviation
   b) Inter-quartile range
   c) Range
   d) Median

3. Which of the following graphical summary is not suitable for examining the dispersion of the data?
    a) Stem and leaf plot
    b) Pie chart
    c) Histogram
    d) Relative frequency polygon

4. The sample mean and median of a data set randomly selected from a population are 44.2 and 64.3 respectively. What is the most probable shape of the distribution of the data?
    a) symmetric
    b) negatively skewed
    c) positively skewed
    d) bimodal

5. Which of the following graph is suitable to highlight percentiles of a set of data?
    a) Frequency polygon
    b) Bar chart
    c) Stem and leaf plot
    d) None of the above plots

6. Which of the following is suitable as a graph for summarizing nominal data?
    a) Frequency polygon
    b) Histogram
    c) Cumulative frequency plot
    d) None of (a), (b) and (c).

7. Which of the following is a suitable measure for summarizing nominal data?
    a) Mean
    b) Mode
    c) Median
    d) None of (a), (b) and (c).

8. Which of the following graph is suitable for examining the presence of extreme observations in a data set?
    a) Box plot
    b) Cumulative frequency plot
    c) Bar chart
    d) None of the above plots

9. Which of the following is not true for a relative frequency table?
    a) Sum of all the relative frequencies is one.
    b) Relative frequencies corresponding to a class interval gives the proportion of observations falling into that interval.
    c) Can be used to summarise nominal data.
    d) Information in the table can always be summarized using a histogram.

10. The smallest and largest dried weights in a sample of 45 dried weights are 23.4 and 64.2 respectively. The sample mean and the third quartile are 50.42 and 55.4 respectively. After computation of the above statistics, it was realized that an observation with value equal to 33.2 had a recording error and has to be replaced with 53.2. The descriptive measures were recalculated after this correction. Identify the measure(s) that will not change.
    a) Mean
    b) Third quartile
    c) Coefficient of variation
    d) All of the above measures will change.

Part *B*

1. The following summary table was constructed from the lengths of fish (cm) in a sample, measured to the nearest first decimal.

Length (cm)	Cumulative frequency
3.0 – 4.4	5
4.5 –5.9	15
6.0 – 7.4	25
7.5 – 8.9	45
9.0 – 10.4	50

i) Find the sample size.

(5 marks)

ii) Find the class width used to construct the given table.

(5 marks)

ii) Find the relative cumulative frequency corresponding to the third class interval and describe what it measures in relation to this study.

(10 marks)

iii) Using a suitable graph, graphically illustrate the data presented in the table.

(10 marks)

iii) Clearly describe all the findings from the graphical summary constructed in part (iii).

(10 marks)

iv) Calculate the sample median of the data.

(10 marks)