



The Open University of Sri Lanka
Bachelor of Medical Laboratory Sciences
Academic Year 2015/16 – Semester 2
MLU3141- Application of Medical Statistics
No Book Test I

Date : 29. 03. 2016 Time : 10.00 a.m. – 11.30a.m.
Registration Number : Duration : 1 ½ hour

There are **four (04)** questions. Answer **all** questions in given papers.

1. A study was conducted by a researcher to identify the factors affecting to weight loss of dieters. A random sample of 200 dieters was selected. The following information has been collected in the study.

Sex (Male, Female), Initial Body Mass Index category (Underweight, Normal weight, Overweight, Obesity), Initial weight of the dieter (kg), Ideal weight of the dieter (kg), Loss weight (Initial weight – Ideal weight) of the dieter (kg), Monthly income of the family (Rs)

1.1. Identify the following variables. (02 marks)

Quantitative variable

Qualitative variable

1.2. Identify an example for each of following scales. (03 marks)

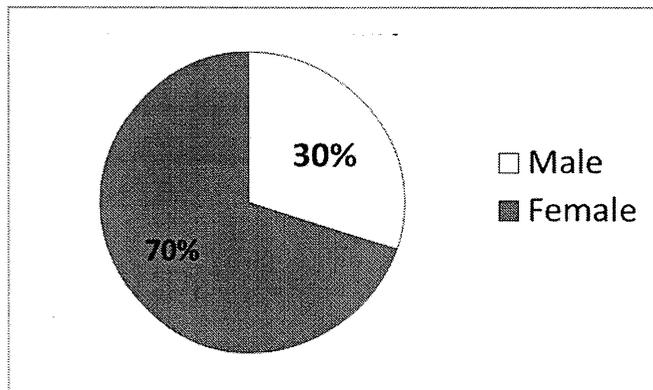
Nominal scale

Ordinal scale

Ratio scale

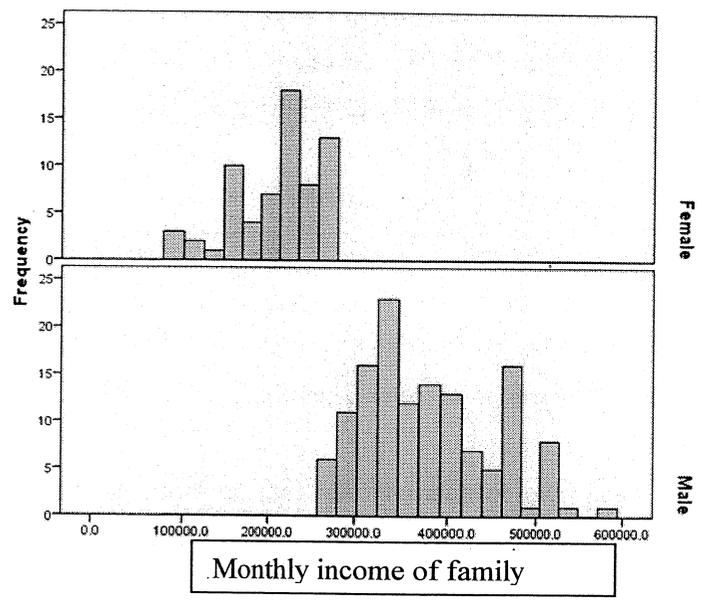
1.3. Comment on the following figures.

a) (04 marks)



b)

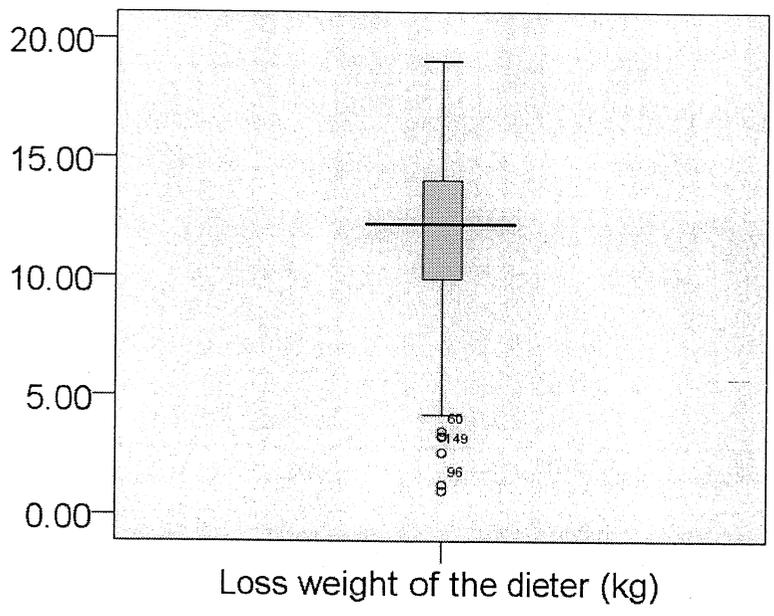
(08 marks)



c)

(08 marks)

d)



2. The heights (cm) of 20 students are mentioned below.

154, 153, 160, 158, 162, 167, 169, 170, 166, 168, 175, 171, 171, 173, 176, 178, 176, 179, 180, 180

2.1. Make an array with the above raw data. (03 marks)

2.2. Calculate the frequency for the above data using class intervals as 150-155, 156-160, 161-165, 166-170, 171-175, 176-180 and tally marks. (05 marks)

2.3. Construct a frequency distribution table with all the characteristics. (05 marks)

2.4. Calculate the relative frequency percentage. (06 marks)

2.5. Calculate the cumulative frequency percentage. (06 marks)

3. A study was conducted using 200 people to screen diabetes by Glucometer reading versus standard Glucose Oxidase method. All blood samples obtained were tested by both methods. According to the results of both tests, the patients were labeled as Diabetes and Non Diabetes separately for both methods. The standard Glucose Oxidase test result indicated that 20 subjects as diabetes. According to the Glucometer, 160 had negative results among which 05 actually had Diabetes.

3.1. Construct a 2×2 table using above details. (10 marks)

3.2. What is the probability that a randomly selected person from total study group has the diabetes determined by the standard Glucose Oxidase method? (05 marks)

3.3. What is the probability that a randomly selected person from total study group has a negative result using the Glucometer? (05 marks)

3.4. What is the probability that a randomly selected person has a positive result using Glucometer test **AND** a positive result using the standard Glucose Oxidase method? (05 marks)

4.

4.1. The mean value of low level quality control (QC) material for cholesterol was 155 mg/dL. The standard deviation was 4.5 mg/dL. One day the QC value was 161 mg/dL. Interpret the result and state whether you accept the QC value or not. (06 marks)

4.2. It was necessary to compare two glucose assaying methods. The standard deviation for the hexokinase method was 4.8 mg/dL and that of glucose oxidase method was 4.0 mg/dL. The mean for the hexokinase method was 120 mg/dL and that of glucose oxidase method was 100 mg/dL.

a) Compare the spread of two methods and **interpret about the precision** of hexokinase and glucose oxidase methods. (06 marks)

b) Select a suitable equation from followings for the calculation. (02 marks)

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

x – Observations

\bar{x} - Mean

n - Number of observations

S- Standard deviation

$$CV = \frac{S}{\bar{X}} \times 100\%$$

CV- Co-efficient of variation

4.3. Consider the following values received from three adult populations for the glucose levels (mg/dL) measured in a laboratory.

Mean = 80; Median = 80, Mode = 80

Mean = 150; Median = 120, Mode = 100

Mean = 250; Median = 300, Mode = 350

a) Mark each of these central tendency values in the suitable distribution curves and state whether the following distributions are normal or skewed. (09 marks)

b) If the distribution is skewed to the right/ left,

Which measure of central tendency yields the highest value? (01 mark)

Which yields the lowest? (01 mark)

***** Copyrights reserved *****