UNIVERSITY OF JAFFNA, SRI LANKA

FACULTY OF ALLIED HEALTH SCIENCES

FIRST YEAR SECOND SEMESTER EXAMINATION IN BScHons(MLS) - 2023

MLSBS 1231 BASIC STATISTICS

Date: 17.06.2025 **Time: 02 Hours**

ANSWER ALL QUESTIONS

1.

1.1 Explain the following concepts in probability.

1.1.1 Mutually exclusive events (05 Marks)

1.1.2 Independent events (05 Marks)

1.2 **Table 1** relates the weights and heights of a group of individuals participating in an observational study.

Weight/ Height	Tall	Medium	Short
Obese	18	28	14
Normal	20	51	28
Underweight	12	25	9

Table 1

1.2.1 Find the total for each row and column? (10 Marks)

1.2.2 Find the probability that a randomly chosen individual from this group is Tall? (10 Marks)

1.2.3 Find the probability that a randomly chosen individual from this group is Obese and Tall? (10 Marks)

1.2.4 Find the probability that a randomly chosen individual from this group is Tall given that the individual is Obese. (15 Marks)

1.2.5 Are the events Obese and Tall independent? (15 Marks)

1.3 A genetic disorder affects 0.5% of the population. A genetic test is:

- 98% accurate in detecting it when present (true positive),
- 2% false positive rate for people without the disorder.

1.3.1 What is the probability that a person tests positive for the genetic disorder? (15 Marks)

1.3.2 What is the probability someone has the disorder if their test is positive? (15 Marks)

2.

2.1 The hospital collected **systolic blood pressure (SBP)** readings from 60 patients and grouped them into intervals:

SBP (mmHg)	Frequency
90-99	5
100-109	8
110-119	15
120-129	20
130-139	7
140-149	5

Determine the

2.1.1 Mean (05 Marks)

2.1.2 Median (05 Marks)

2.1.3 Mode (05 Marks)

2.1.4 Standard deviation (10 Marks)

2.1.5 Plot a Histogram to visualize the frequency distribution. (10 Marks)

2.1.6 Pearson's coefficient of skewness. (10 Marks)

2.1.7 Using the coefficient of skewness obtained in (vi), explain about the shape of the data set. (10 Marks)

2.2 Suppose that we are told that the heights of adult males in a particular region of the world are normally distributed with a mean of 70 inches and standard deviation of 2 inches.

2.2.1 Approximately what proportion of adult males are taller than 73 inches? (15 Marks)

2.2.2 What proportion of adult males are between 72 and 73 inches? (15 Marks)

2.2.3 If there are 2000 adult males in this region, how many males are there whose height is less than 73 inches? (15 Marks)