# UNIVERSITY OF JAFFNA, SRI LANKA

## FACULTY OF ALLIED HEALTH SCIENCES

### FIRST YEAR SECOND SEMESTER EXAMINATION IN BScHons (MLS) – 2020

### MLSBS 1231 BASIC STATISTICS

**Date: 01.09.2022**                                                                    **Time: 2 hours**

**ANSWER ALL QUESTIONS**

1.

1.1. In an area, 30 % of the population is identified to be Covid-19 patients. Among the identified Covid-19 patients 70 % are workers of a Garment factory.

What is the probability of a randomly selected person from that area to be a Garment factory worker affected by Covid-19?                                       **(20 marks)**

1.2. The 'PCR test' is used to test whether or not a person has COVID-19. The test is not perfect; there is a 10% chance that a person who has COVID-19 is falsely tested negative and a 5% chance a person who does not have COVID-19 is falsely tested positive. If the COVID-19 is infected among 8% of the tested population,

What is the probability that a person who tests negative has COVID-19?        **(40 marks)**

1.3. In a certain country the time taken for a common infection to clear up is distributed with mean $\mu$ days and standard deviation 2.6 days. 25% of these infections clear up in less than 7 days.

    1.3.1. Find the value of $\mu$.                                                                 **(20 marks)**

    1.3.2. In another country the standard deviation of the time taken for the infection to clear up is the same as in part (i), but the mean is 6.5 days. The time taken is normally distributed.

    Find the probability that, in a randomly chosen case from this country, the infection takes longer than 6.2 days to clear up.                                             **(20 marks)**

2.

2.1. Transportation Safety The chart shows the number of job-related injuries for each of the transportation industries for 1998.

| Industry | Number of injuries |
|---|---|
| Railroad | 4520 |
| Intercity bus | 5100 |
| Subway | 6850 |
| Trucking | 7144 |
| Airline | 9950 |

2.1.1. What are the variables under study? (3 marks)

2.1.2. Categorize each variable as quantitative or qualitative. (3 marks)

2.1.3. Categorize each quantitative variable as discrete or continuous. (3 marks)

2.1.4. Identify the level of measurement for each variable. (3 marks)

2.1.5. The railroad is shown as the safest transportation industry. Explain. (4 marks)

2.1.6. What factors other than safety influence a person's choice of transportation?

(4 marks)

2.2. Using the histogram shown here, do the following.
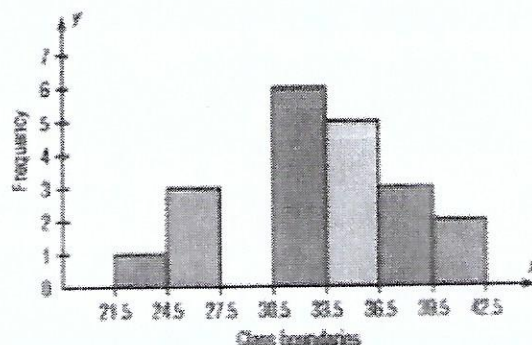


2.2.1. How many values are in the class 27.5–30.5? (5 marks)

2.2.2. How many values fall between 24.5 and 36.5? (5 marks)

2.2.3. How many values are below 33.5? (5 marks)

2.2.4. How many values are above 30.5? (5 marks)

2.2.5. Construct a frequency distribution; include class limits, class frequencies, midpoints, and cumulative frequencies. (10 marks)

2.2.6. Construct a frequency polygon. (5 marks)

2.2.7. Construct an ogive. (5 marks)

2.3. The data on number of patients attending a hospital in a month are given below.

| No. of patients | 0-<10 | 10-<20 | 20-<30 | 30-<40 | 40-<50 | 50-<60 |
|---|---|---|---|---|---|---|
| No. of days attending | 2 | 5 | 10 | 8 | 3 | 2 |

2.3.1. Find the average number of patients attending the hospital in a day.

2.3.2. Calculate the,

2.3.2.1. Median (8 marks)

2.3.2.2. Mode (8 marks)

2.3.2.3. Standard deviation (8 marks)

2.3.2.4. Measures of skewness (8 marks)

2.3.2.5. Coefficient of variation, of the above data (8 marks)