



UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES

DEPARTMENT OF PHARMACY

FIRST BPHARM PART II EXAMINATION – JUNE/JULY 2023

PH1262 BIOSTATISTICS – SEQ PAPER

TIME: TWO HOURS

INSTRUCTIONS

- There are **four** questions in this paper.
- Answer all questions.
- No paper should be removed from the examination hall.
- Do not use any correction fluid.
- Use illustrations where necessary.

1.

1.1 Classify each of the following variables as either categorical or numerical. **(30 marks)**

1.1.1 Birth weight (in grams) of new born babies

1.1.2 Number of days stayed in a hospital

1.1.3 Growth rate of a virus (per day)

1.1.4 LDL level (mg/dL) of a group of Cardiac patients

1.1.5 Type of disease

1.2 Classify each of the following variables as either dichotomous or numerical. **(30 marks)**

1.2.1 Pulse rate of a group of children

1.2.2 Test result (positive or negative)

1.2.3 Systolic blood pressure (as either ≤ 140 (mmHg) or higher than 140 (mmHg))

1.2.4 Body temperature ($^{\circ}\text{C}$)

1.2.5 Gender

1.3 The normal fasting blood glucose concentration (mg/dl) of a group of 11 patients are given below.

120, 130, 140, 120, 160, 150, 100, 130, 180, 110, 130

1.3.1 Arrange the data set in an ascending order. **(10 marks)**

1.3.2 What is the range of the data set? **(10 marks)**

1.3.3 Display the data set using a box and whisker plot. **(20 marks)**

2.

2.1 List four characters of the standard normal distribution. **(20 marks)**

2.2 Give two examples of discrete random variables. **(10 marks)**

2.3 Give two examples of continuous random variables. **(10 marks)**

2.4 It is observed that stage four cancer patients live on an average of 12 months with the *SD* of 2 months. Find the probability that a selected stage 4 cancer patient will live.

2.4.1 more than 14 months (30 marks)

2.4.2 less than 6 months (30 marks)

3.

3.1 Suppose that, the probability that a person is having high cholesterol level (≥ 250 mg/dL) is 0.40. The probability of a person is having a blood group A is 0.20. What is the probability of someone randomly selected having blood group A and having a high cholesterol level?

(20 marks)

3.2 State whether the following are mutually exclusive or mutually inclusive events. (20 marks)

3.2.1 Being an obese and being an older adult

3.2.2 Being a person with hypertension and being an alcoholic

3.3 State the most probable probability distribution of the following events. (40 marks)

3.3.1 HDL level of middle age people

3.3.2 Children with a bacterial infection might respond to antibiotic therapy or not

3.3.3 Number of new cases of COVID-19 admitted to THK per week

3.3.4 Number of deaths occurs at the emergency department during weekends

3.4 In a sample of older adults, there were 100 hypertensive and 50 non-hypertensive patients. Among hypertensive patients there were 50 with senile dementia and among non-hypertensives there were 20 with senile dementia. If a person is selected from this sample, find the probability that the selected person is a hypertensive or having senile dementia. (20 marks)

4.

4.1 List two discrete probability distributions. (10 marks)

4.2 List two continuous probability distributions. (10 marks)

4.3 In a pharmacy on an average 12 patients purchase inhalers per hour. What is the probability of purchasing exactly 6 inhalers in an hour? (20 marks)

4.4 List five uses of medical statistics in pharmacy practice. (20 marks)

4.5 In an experiment with 30 patients, it was observed that the body metabolizes about 4 mg of a certain drug, on average, per hour with the *SD* of 1 mg.

4.5.1 Calculate the 95% CI of the population mean. (20 marks)

4.5.2 How do you interpret the result? (20 marks)

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