



SEPTEMBER 2020

COM 301/ CDC313/COU4113 STATISTICS

**Instructions**

- i) This exam paper contains SIX questions carrying 10 mark each.
- ii) Use the Case Study passage below to answer the questions
- iii) Round off your answers to the nearest one decimal place.
- iv) Show all your workings on the answer sheet
- v) Answer any four questions

---

---

**STATISTICAL ANALYSIS CASE STUDY**

The healing power of prayer has been the subject of enduring interest not just among the faith community, but also among psychologists, communicators and academics. However, your reading of the literature suggests that it has been a controversial idea to date.

Having attended a statistics class, you have had a growing curiosity to subject the idea to your own empirical scrutiny. Recently, you decided to test the theory that prayer reduces blood pressure. You conducted your study at a neighborhood medical center where you randomly interviewed patients after checking their blood pressure.

You measured the variable “Blood Pressure” (BP) on an ordinal scale as follows: 1=Normal; 2=Elevated; 3=High; 4=Hypertensive; 5=Danger zone. You then measured prayer by the number of times the patient prayed in the last one week. You labelled this variable as “Prayer Frequency” (PF).

You recorded the data you collected as follows:

|    |   |    |   |    |   |   |   |   |   |   |   |   |
|----|---|----|---|----|---|---|---|---|---|---|---|---|
| PF | 5 | 14 | 0 | 10 | 7 | 0 | 2 | 0 | 8 | 3 | 9 | 0 |
| BP | 4 | 1  | 4 | 1  | 2 | 3 | 4 | 5 | 3 | 3 | 2 | 4 |

### Question 1

- a) Present the percentage frequency distribution of the patients' blood pressure in a table (3 marks)
- b) Draw a histogram to represent the distribution of the patients' prayer frequency (3 marks)
- c) Analyze the skewness of the patients' prayer frequency (4 marks)

### Question 2

- a) Compute the patients' median prayer frequency (3 marks)
- b) Explain why the mode is not the best measure of central tendency of the patients' prayer frequency. (3 marks)
- c) Justify your choice of the most accurate measure of central tendency for the dataset. (4 marks)

### Question 3

Determine the following measures of dispersion of the patient's prayer frequency

- a) Range (2 marks)
- b) Third Quartile (2 marks)
- c) Range for the middle 50 percent (6 marks)

### Question 4

- a) Present the dataset using a scatterplot (7 marks)
- b) From your observation of the scatterplot, interpret the correlation between prayer and blood pressure (3 marks)

**Question 5**

- a) Find the correlation coefficient for the dataset (8 marks)
- b) Interpret the strength of the correlation between prayer and blood pressure (2 marks)

**Question 6**

- a) Determine the blood pressure of patients who did not pray at all (7 marks)
- b) Compute the minimum number of prayers the patients needed to say in a week in order to maintain normal blood pressure (3 marks)