

## Probability and Statistics (MT2005)

Date: March 1<sup>st</sup> 2024

### Course Instructor(s)

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## Sessional-I Exam

**Total Time: 1 Hours**

**Total Marks: 30**

**Total Questions: 02**

**Semester: SP-2024**

**Campus: Karachi**

**Dept.: Computer Science**

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Student Name

Roll No

Section

Student Signature

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### ***CLO # 1: Describe the fundamental concepts in probability and statistics***

**Question 1:** A pharmaceutical company has developed a new medicine for a disease, one side effect of the medicine is disturbed sleep patterns. To understand the effect of new medicine on sleep patterns of adults a study is conducted. This study includes 40 males and females of age between 25 years to 40 years. The measure observed is the time, in minutes, that it takes to fall asleep. These data are obtained:

|      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|
| 69.3 | 56.0 | 22.1 | 47.6 | 53.2 | 48.1 | 52.7 | 34.4 |
| 60.2 | 43.8 | 23.2 | 13.8 | 28.6 | 25.1 | 26.4 | 34.9 |
| 29.8 | 28.4 | 38.5 | 30.2 | 30.6 | 31.8 | 41.6 | 21.1 |
| 36.0 | 37.9 | 13.9 | 15.0 | 9.4  | 67.0 | 20.5 | 24.4 |
| 24.7 | 29.6 | 30.2 | 32.4 | 36.6 | 35.3 | 75.2 | 20.7 |

- Construct a frequency distribution table using 8 classes of equal width. Lower class limit of first class should be the smallest value of the given data set that is 9.4. [6 Marks]
- Construct the histogram of the data and comment on the shape of distribution. [3 Marks]
- What can be said on the position of mean, median and mode of the data from the shape of distribution? [2 Marks]
- Calculate the Standard deviation and coefficient of variation. [4 Marks]
- Draw a box plot after calculating the quartiles and conclude your findings. [5 Marks]

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## Question 2:

- a. How many three-digit numbers can be formed from the digits 0, 1, 2, 3, 4, 5, and 6 if
  - i. if each digit can be used only once? **[2 Marks]**
  - ii. How many of these are odd numbers? **[2 Marks]**
- b. Students apply for a teaching assistant position for a specific teacher. The teacher agrees to assign a student as TA or move to another student till four student interviews are conducted. Draw a tree diagram for the sample space for this experiment." **[3 Marks]**
- c. An engineering firm is hired to determine if certain waterways in Virginia are safe for fishing. Samples are taken from three rivers. Find the probability of the event that the second river is safe for fishing. **[3 Marks]**