University of Central Punjab

Faculty of Information Technology and Computer Science

Course Title: Probability and Statistics Course Code: SESS-2733

Assignment 3

Peer Assignment

Total marks: 50 Obtained marks:\_\_\_

|  |  |
| --- | --- |
| Name | Roll number |
|  |  |
|  |  |
|  |  |
|  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **CLO #** | **Course Learning Outcome (CLO)** | **Taxonomy Level** | **Mapping to PLO** |
| CLO 1 | Apply fundamental concepts of probability rules and Bayes' theorem to solve problems in engineering and computing. | **C3** | **PLO 2** |

**Instructions:**

1. **Attempt all questions.**
2. **Write your answer showing all steps required to perform the task.**
3. **Assignment should be Hand Written. Computerized assignment is not accepted**
4. **Assignment should be submitted on A4 sheets or Assignment sheets only. Violation will result to deduction of 5 mark from the scored marks.**
5. **Each student will have attached this front page with his/her assignment. Violation will result to deduction of 3 mark from the scored marks.**
6. **Due Date for Assignment on portal is June 03, 2025. Till 12:00 pm**
7. **No Late submission accepted**

# Problem 1: Applying Set Theory to Probability & Conditional Probability (15 marks)

In a class of 50 students: 30 like Math (Set A), 25 like Science (Set B), 10 like both Math and Science (A∩B)

**A**. What is the probability that a randomly selected student likes at least one of the Subject?

**B**. What is the probability that a student likes neither?

**C**. What is the probability that a student like sciencegiven they like math?

# Problem 2: Find Sample Space & Probability of Event (15 marks)

Two six-sided dice are rolled.

**A.** List the sample space.  
**B.** What is the probability that the sum of the numbers is **greater than 9?**

**C**. What is the probability of getting sum of values showed on dice is 10?

# Problem 3: Law of Total Probability (10 marks)

An email server routes incoming emails through two different servers:

**A**. Server A handles 70% of the emails, and 2% of emails processed by Server A get delayed. **B**. Server B handles 30% of the emails, and 5% of emails processed by Server B get delayed.

What is the probability that a randomly selected email from the entire system is not delayed?

# Problem 4: Bayes Theorem (10 marks)

A factory has two machines: Machine A produces 60% of the items and has a defect rate of 2%, while Machine B produces 40% of the items with a defect rate of 5%. An item is selected at random and found to be defective. What is the probability that it was produced by Machine B?