



# UNIVERSITY OF THE PUNJAB

B.S. in Computer Science / First Semester : Fall 2023

Subject: Probability & Statistics

Paper: MS-152

Roll No. [REDACTED]  
Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

Q.1. Answer the following short questions.

(6x5=30)

- I. How many permutations of 4 different letters are there, chosen from the twenty six letters of the alphabet?
- II. One card is drawn from a deck of 52 cards, well-shuffled. Calculate the probability that the card will not be an ace?
- III. Find the range and coefficient of range of the data: 63, 89, 98, 125, 79, 108, 117, 68?
- IV. Given the normally distributed variable  $X$  with mean 18 and standard deviation 2.5, find the value of  $k$  such that  $P(X < k) = 0.2236$ ?
- V. A teacher asked the students to complete 60 pages of a record note book. Eight students have completed only 32, 35, 37, 30, 33, 36, 35 and 37 pages. Find the standard deviation of the pages yet to be completed by them?
- VI. Let  $X$  be a continuous random variable with PDF  $f(x) = \begin{cases} x, & 0 \leq x \leq 1 \\ 0, & \text{otherwise} \end{cases}$ . Find the expected value of  $X$ .

Q.2. Answer the following questions.

(3x10=30)

- I. A large chain retailer purchases a certain kind of electronic device from a manufacturer. The manufacturer indicates that the defective rate of the device is 3%. The inspector of the retailer randomly picks 20 items from a shipment. What is the probability that there will be at least one defective item among these 20?
- II. Given a random variable  $X$  having a normal distribution with mean 50 and standard deviation 10, find the probability that  $X$  assumes a value between 45 and 65.
- III. Calculate mean deviation and coefficient of mean deviation from mean in continuous grouped case, showing the weights of 60 apples. Also draw the histogram of the data.

Weights (grams)	65-84	85-104	105-124	125-144	145-164	165-184	185-204
Frequency	09	10	17	10	05	04	05