National University of Computer and Emerging Sciences, Lahore Campus				
	Course:	**Probability and Statistics**	**Course Code:**	**MT2005**
	Program:	**BS(Computer Science)**	**Semester:**	**Spring-2025**
	Instructor:	**Ms. Kanwal Saleem**	**Total Marks:**	**30**
	Submission Date:	**05-05-2025**	**Weight**	**4%**
	Section:	**BCS-4F**	**Page(s):**	**2**
	Evaluation:	**Assignment-3**	**Roll No:**	
Instruction/Notes:	**Attempt All Questions**			

Instructions ***Follow the instructions carefully otherwise you will lose few marks.***

1. Use A4 size blank pages for solving the assignment.
2. Use only blue/black pen for solving the assignment.

QUESTION 1: **(Marks=6+2)**

Estimating Customer Service Call Duration

The customer experience manager at a digital marketing agency wants to improve their client satisfaction by reducing the time it takes to resolve customer support queries. To evaluate a new training strategy for the support team, the manager collects data on the duration (in minutes) of 15 randomly selected customer service calls handled after the training.

Call Duration Data (in minutes):

9 12 14 10 13 8 11 15 12 14 9 10 13 12 11

It is known that under the old training program, the average call resolution time was 15 minutes**.** Using this sample data:

a) Construct a 95% confidence interval to estimate the average time it takes to handle a customer service call after the new training.
b) Interpret the results in the context of improving customer experience.

QUESTION 2: **(Marks=2+5+3)**

If a publisher of nontechnical books takes great pains to ensure that its books are free of typographical errors, so that the probability of any given page containing at least one such error is 0.005 and errors are independent from page to page, what is the probability that one of its 600-page novels will contain

1. Exactly one page with errors?
2. At most three pages with errors?
3. At least 1 pages with errors?

QUESTION 3: **(Marks=2+4)**

Mopeds (small motorcycles with an engine capacity below 50 cm^3) are very popular in Europe because of their mobility, ease of operation, and low cost. A rolling bench test for determining maximum vehicle speed was described. A normal distribution with mean value 46.8 km/h and standard deviation 1.75 km/h is postulated. Consider randomly selecting a single such moped.

(a) What is the probability that its maximum speed is at most 50 km/h?
(b) What is the probability that its maximum speed is at least 48 km/h?

QUESTION 4: **(Marks=2+4)**

10 containers, all are of the same size, have lost their labels. It is known that 5 contains Desktop computers and 5 contains Laptops. If 5 are selected at random, what is the probability that

(a) All contain desktops.
(b) Three or more contains desktops.
