Introduction to Statistical Methods

(S1-25_AIMLCZC418) – Assignment 1

AIML Section- 7

Each question carries 2.5 Marks (2.5 x 4 = 10 Marks)
Duration:20th Nov, 2025 – 2nd December 2025
1) Submissions are individual
2) Solve these on paper, scan, and upload
3) Plagiarism results in zero marks
4) Write your name, BITS ID and Section on each page
5) Only handwritten solutions with formula, full steps with proper justification are required.

Q1. A group of 12 students obtained the following scores in a mathematics quiz:
28, 35, 40, 42, 45, 50, 52, 55, 60, 65, 70, 75.
(i) Calculate the mean, median, variance, SD, range, and interquartile range.

(ii) Identify whether the data is left/right skewed.

(iii) Using the IQR method, identify whether any outliers exist in the dataset, with justification.

Q2. A patient undergoes two independent diagnostic tests for the same disease. Each test has a 90% sensitivity and 95% specificity.
a) What is the probability that both tests return positive for a person who has the disease?
b) What is the probability that both tests return positive for a person who does not have the disease?

Q3. You have the following dataset:

ID	Plan	Support Calls	Churn
1	Basic	Low	No
2	Premium	High	Yes
3	Basic	High	Yes
4	Premium	Low	No
5	Basic	Low	No

Using Naive Bayes, predict Churn for a new customer with: Plan = Premium, and Support Calls = High**.**

Q4. An e-commerce company uses an AI model to automatically classify newly uploaded products into categories. About 20% of all products on the platform are truly Electronics items. The AI model is not perfect:

- If a product is actually an Electronics item, the model correctly labels it as Electronics 93% of the time.
- If a product is *not* Electronics, the model still mistakenly labels it as Electronics 4% of the time.

A new product has just been uploaded, and the model has labelled it as Electronics.

What is the probability that the product is an Electronics item?

----ALL THE BEST----