Introduction to Statistical Methods

(S1-25_AIMLCZC418) – Assignment 1

AIML Section- 4

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 librarian records the number of pages read by 12 students during a 20-minute silent reading session.

The data (in number of pages) are: 16, 20, 12, 25, 18, 22, 19, 15, 13, 21, 17, 28.
a) Compute the mean, median, sample variance, range, and Q1, Q3 for this group.

b) Use the IQR method to identify the outliers in the data set.

Q2. A student takes his examination in four subjects A, B, C, and D. He estimates his chance of passing in A as 4/5, in B as 3/4, in C as 5/6 and in D as 2/3. To qualify, he must pass in A and at least two other subjects. What is the probability that he qualifies?

Q3. You are given the following training dataset:

Email	Sender	Contains Link	Spam
1	Friend	No	No
2	Unknown	Yes	Yes
3	Friend	Yes	No
4	Unknown	No	No
5	Unknown	Yes	Yes

Using Naive Bayes with Laplace smoothing, predict whether a new email is Spam if it has:
Sender = 'Unknown' and Contains Link = 'No'

Q4. Given the table below, consider the following random experiment:

Capacitance (µF)	Box # 1	Box # 2	Box # 3	Total
0.1	35	25	40	100
0.5	75	95	70	240
1.0	60	10	65	135
Total	170	130	175	475

Assume that the box selection and the capacitor selection are both with equal probability.
(i)If a capacitor of $0.1\mu F$ is selected, what is the probability that it came from box 3?

(ii)If box 2 is selected, what is the probability that it has a capacitor of 0.5 µF?

----ALL THE BEST----