SCHOOL OF ADVANCED SCIENCES

DEPARTMENT OF MATHEMATICS

WINTER SEMESTER - 2024-25

PMDS503P – Statistical Inference

LAB – Programming with R

LAB ASSIGNMENT Date: 06.03.2025

1. The last date for submission of the E-record for the assignment is 06th March 2025.
2. Mention the Register Number, Name, Slot details, course code and Course Title on the first page of the document.

Assignment No. 3

1. The viscosity of two different brands of car oil is measured and the following data resulted:

Brand 1	10.62	10.58	10.33	10.72	10.44	10.74	
Brand 2	10.50	10.52	10.58	10.62	10.55	10.51	10.53

Test the hypothesis at α = **0.05 & 0.01** that the mean viscosity of the two brands is equal, assume that the two populations are normal distributed with equal variances.

2. A college prep program compared the practice SAT scores (math and reading combined) given before and after an eight-week instruction for each student. The scores are given below:

	Student SAT Score								
	1	2	3	4	5	6	7	8	9
Before	1280	1200	1050	1190	1250	1290	1220	1270	1260
After	1380	1310	1090	1240	1290	1360	1270	1330	1310

Test if the average score has been raised by 50 points using α = **0.05 & 0.10**.

3. Fifteen fishes were caught at one coast and twenty on another coast. Their length was measured in centimetres. The measurements were as displayed below:

Coast 1:	18.8	20.5	20.0	21.0	17.8	18.2	17.8	19.5	20.0	18.2	18.4
	19.8	19.8	20.3	19.0							
Coast 2:	19.8	21.0	20.0	19.5	18.9	18.0	18.5	18.2	20.2	19.0	19.2
	20.2	19.2	17.0	18.8	17.6	18.3	19.6	20.2	18.4		

An investigator is interested to test whether the variability in fish size at tow coast is same. Test the significance at 1% and 5% level of significance.

4. A newspaper publisher, trying to pinpoint his market's characteristics, wondered whether newspaper readership in the community is related to reader's educational achievement. A survey questioned adults in the area on their level of education and their frequency of readership. The results are shown in the following table.

Frequency of Readership	***Level of Educational achievement***			
	Post graduate	***Graduate***	***Secondary***	***Primary***
Never	15	18	22	25
Sometimes	16	24	15	25
Morn or Even	22	14	18	16
Both Editions	27	14	15	14

Is the Frequency of readership of Newspaper is depend on the level of educational achievement? Use $\alpha = 1\% \; and \; 5\%$.

5. Fit a Binomial distribution for the following distribution and also test the goodness of fit at $\alpha = 0.05$.

x	0	1	2	3	4
f	8	46	55	40	11