SCHOOL OF ADVANCED SCIENCES

DEPARTMENT OF MATHEMATICS

WINTER SEMESTER - 2024-25

PMDS503P – Statistical Inference LAB

LAB – Programming with R

LAB ASSIGNMENT Date: 17.02.2025

1. Last date for submission of E-record for Assignment is 17th **February 2025.**
2. Mention the Register Number, Name, Slot details, course code and Course Title on the first page of the document.

Assignment No. 2

1. The duration of treating a disease by an existing medication has a mean of **14** days. A drug company claims that a new medication can reduce the treatment time. To test this claim, the new medication is tried on 60 patients and their times to recovery are recorded. If the mean recovery time is 13.5 days and the standard deviation is 3 days in this sample, answer the following questions.

   b. Formulate the hypotheses and determine the rejection region of the test with a significance level of α**= 0.05 & 0.01**. What is your decision?

2. A manufacturer of paints (company A) claimed that the drying time of its paint is shorter than that of another company (company B). A market research firm conducted a test to find out if the manufacturer's claim is true. Paints produced by the two companies were randomly selected, and the drying times were measured. Summary data on drying time are given below.

   Company A: $m = 45$, $\bar{X} = 63.5$ minutes, $s_1 = 5.4$ minutes
   Company B: $n = 60$, $\bar{Y} = 66.2$ minutes, $s_2 = 5.8$ minutes

   Conduct a test to find out if the drying time of the paints made by company A is shorter, at α **= 0.05 & 0.01** level of significance.

3. A study is undertaken to compare the cure rates of certain lethal diseases by drug A and drug B. Among 190 patients who took drug A, 100 were cured, and among 65 patients who took drug B, 55 were cured. Does the data provide strong evidence that the cure rate is different between the two drugs? Test the hypothesis at 5% and 1% level of significance.

4. Because of tourism in the state, it was proposed that public schools in Michigan begin after Labor Day. To determine whether support for this change was greater than 65%, a public poll was taken and given that 414 out of a sample of 600 favor a post-Labor Day start.

   (i) Which hypothesis would you accept if the significance level is $\alpha = 0.05$?

   (ii) Which hypothesis would you accept if the significance level is $\alpha = 0.01$?