



SCHOOL OF ADVANCED SCIENCES
DEPARTMENT OF MATHEMATICS
WINTER SEMESTER - 2024-25
PMDS503P – Statistical Inference

LAB – Programming with R

LAB ASSIGNMENT

Date: 27.03.2025

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1. The last date for submission of the E-record for the assignment is **03rd April 2025**.
 2. Mention the Register Number, Name, Slot details, course code and Course Title on the first page of the document.
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Assignment No. 4

1. Printed circuit cards are placed in a functional test after being populated with semiconductor chips. A lot contains 140 cards, and 20 are selected without replacement for functional testing.
 - (a) If 20 cards are defective, what is the probability that at least 1 defective card is in the sample?
 - (b) If 5 cards are defective, what is the probability that at least 1 defective card appears in the sample?
2. The number of failures of a testing instrument from contamination particles on the product is a Poisson random variable with a mean of 0.02 failure per hour.
 - (a) What is the probability that the instrument does not fail in an 8-hour shift?
 - (b) What is the probability of at least one failure in a 24-hour day?
3. The thickness of a laminated covering for a wood surface is normally distributed with a mean of 5 millimeters and a standard deviation of 0.2 millimeter.
 - (a) What is the probability that a covering thickness is greater than 5.5 millimeters?
 - (b) If the specifications require the thickness to be between 4.5 and 5.5 millimeters, what proportion of coverings do not meet specifications?
 - (c) The covering thickness of 95% of samples is below what value?
4. The time between calls is exponentially distributed with a mean time between calls of 10 minutes.
 - (a) What is the probability that the time until the first call is less than 5 minutes?
 - (b) What is the probability that the time until the first call is between 5 and 15 minutes?
 - (c) Determine the length of an interval of time such that the probability of at least one call in the interval is 0.90.