



Program: BS (CS & SE)
Semester: Spring-2022
Course: MT2005-Probability & Statistics

Examination: Assignment # 04
Total Marks: 10, Weightage: 2.5
Date of Submission: 03 / 06 / 2022

Problem 1

The probability that a certain kind of component will survive a shock test is $3/4$. Find the probability that exactly 2 of the next 4 components tested survive.

Problem 2

A large chain retailer purchases a certain kind of electronic device from a manufacturer. The manufacturer indicates that the defective rate of the device is 3%. The inspector randomly picks 20 items from a shipment. What is the probability that there will be at least one defective item among these 20?

Problem 3

In a certain industrial facility, accidents occur infrequently. It is known that the probability of an accident on any given day is 0.005 and accidents are independent of each other.

- (a) What is the probability that in any given period of 400 days there will be an accident on one day?
 - (b) What is the probability that there are at most three days with an accident?
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Problem 4

An automobile manufacturer is concerned about a fault in the braking mechanism of a particular model. The fault can, on rare occasions, cause a catastrophe at high speed. The distribution of the number of cars per year that will experience the catastrophe is a Poisson random variable with $\lambda = 5$. (a) What is the probability that at most 3 cars per year will experience a catastrophe? (b) What is the probability that more than 1 car per year will experience a catastrophe?

Problem 5

An internet search engine looks for a certain keyword in a sequence of independent web sites. It is believed that 20% of the sites contain this keyword.

- (a) Compute the probability that at least 5 of the first 10 sites contain the given keyword.
 - (b) Compute the probability that the search engine had to visit at least 5 sites in order to find the first occurrence of a keyword.
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The End