COMSATS University Islamabad, Abbottabad Campus
Department of Mathematics

Terminal Fall-2024

Class: BSE-5A/3R & BCS-4B
Subject: SPT
Instructors: M Rafay Shah
Name: [redacted]

Date: 16/01/2025
Total Time Allowed: 3Hrs
Max Marks: 100
Registration # [redacted]

Section-A (Marks: 36)

Question 1)

From past experiences a stockbroker believes that under present economic conditions a customer will invest in tax-free bonds with a probability of 0.7, will invest in mutual funds with a probability of 0.2, and will invest in both tax-free bonds and mutual funds with a probability of 0.25. At this time, find the probability that a customer will invest in either tax-free bonds or mutual funds.

Question 2)

A traffic control engineer reports that 75% of the vehicles passing through a checkpoint are from within the state. What is the probability that fewer than 3 of the next 7 vehicles are from within state?

Question 3)

Suppose that the time, in hours, taken to repair a heat pump is a random variable X having a gamma distribution with parameters $\alpha = 2$ and $\beta = 1/4$. What is the probability that the next service call will require at most 1 hour to repair the heat pump?

Question 4)

From a lot of 12 missiles, 5 are selected at random and fired. If the lot contains 3 defective missiles that will not fire, what is the probability that at most 2 will not fire?

Question 5)

The probability that a person will die from a certain respiratory infection is 0.001. Find the probability that more than 4 of the next 3000 so infected will die?

Question 6)

A certain area of the eastern United States is, on average, hit by 8 hurricanes a year. Find the probability that for a given year that area will be hit by anywhere from 5 to 7 hurricanes?

CamScanner