Question # 1 (15 marks)

An auto insurance company studied data on its automobile accidents and determined that 0.04% of drivers were involved in at least one accident during a year. To promote the safe driving and potentially reduce the accident rate, the company decided to introduce the new Telematics mobile app program. The Telematics mobile app can be downloaded and installed on a smart phone. The Telematics app is an interactive tool that allows you to analyze and improve your driving habit and then rewards you with savings on your auto insurance premium renewal.

One year after introducing the telematic app, the company found that 70% of the drivers involved in accidents did not have the Telematics mobile app. In addition, 80% of the drivers who were not involved in any accidents have the Telematic mobile app installed.

a. Construct either a 2-way probability table or probability tree of this problem.
b. What is the probability that a driver was involved in at least an accident and did not have the Telematics mobile app last year.
c. What is the probability that a driver was not involve in any accident or had the Telematics mobile app installed last year?
d. Does a driver who has the Telematics mobile app have a higher probability of being involved in accidents? Support your answer quantitatively below.
e. What is the probability that a driver who does not have the Telematics mobile app will not be involved in any accident in a year.

Question # 2 (15 marks)

A retailer wanted to estimate the monthly fixed and variable selling expense. As a first step, she collected data from past 8 months. The total selling expense ($1,000) and the total sales ($1,000) were recorded and listed below. (Please use the table below to do calculation for part b, c, and e)

Total Sales	Selling Expenses				
20	14				
40	16				
60	18				
50	17				
50	18				
55	18				
60	18				
70	20				

a. Compute the median of the total sales.
b. Compute the standard deviation of the total sales.
c. Compute the standard deviation of the selling expenses.
d. Compute the 60th percentile of the total sales.
e. Compute the covariance.
f. Compute the coefficient of correlation.