**HOMEWORK #26: DISCRETE PROBABILITY AND BAYESIAN PROBABALITY**

1.) The government designates a single cause for each death in CANADA. The resulting data indicate that 33% of deaths are due to cardiovascular ischemia and 26% are due to cancer.

(a) Calculate the probability that the death of a randomly selected person will be due to cardiovascular ischemia or cancer.

(b) Calculate the probability that the death will be due to some other cause.

2.) In a study, physicians were asked what the odds of breast cancer would be in a woman who was initially thought to have a 7.5% risk of cancer but who ended up with a positive mammogram result (a mammogram accurately classifies about 80% of cancerous tumors and 90% of benign tumors.) 95 out of a hundred physicians estimated the probability of cancer to be about 75%. Do you agree?

3.) An auto insurance company charges younger drivers a higher premium than it does older drivers because younger drivers as a group tend to have more accidents. The company has 3 age groups: Group A includes those under 25 years old, 27% of all its policyholders. Group B includes those 25-39 years old, 43% of all its policyholders, Group C includes those 40 years old and older. Company records show that in any given one-year period, 16% of its Group A policyholders have an accident. The percentages for groups B and C are 2% and 4%, respectively.

(a) What percent of the company's policyholders are expected to have an accident during the next year?

(b) Suppose a person has just had an accident. If he/she is one of the policyholders, calculate the probability that he/she is under 25 years of age.