**Class Activity # Chapter 3 @ Applications of Binomial and Poisson Distribution**

**Problem 1 (Application of Binomial Distribution)**

The presence of bacteria in a urine sample (bacteriuria) is sometimes associated with symptoms of kidney disease in women. Suppose a determination of bacteriuria has been made over a large population of women at one point in time and 5% of those sampled are positive for bacteriuria.

1. If a sample of size 5 is selected from these population, what is the probability that 1 or more women are positive?
2. Let X be the number of women who are positive for bacteriuria in (a). Answer the following question:

(i) What is the probability distribution of X?

(ii) What is the expected value of X?

(iii) What is the variance of X?

(iv) What is the coefficient of variation of X?

(v)

(vi)

**Problem 2 (Application of Poisson distribution)**

The number of deaths from typhoid fever over a 1-year period is Poisson distributed with parameter 4.6. Let Y denotes the number of deaths over a given period of time. Answer the following questions:

1. What is the probability distribution of the number of deaths from typhoid fever over a 6-month period?
2. What is the probability distribution of the number of deaths from typhoid fever over a 3-month period?
3. What is the probability distribution of the number of deaths from typhoid fever over a 2-year period?
4. What is the probability that there will be exactly 3 deaths over a 1-year period?
5. What is the probability that there will at most 3 deaths over a 1-year period?
6. What is the probability that there will at least 4 deaths over a 1-year period?
7. Let Y denotes the number of deaths over 1-year period. Compute the following:

(i)

(ii)