Course: STAT-319
Term: 181
Homework # 2
Material: Chapter 3
Due Date: Saturday, 29-September-2018

Q1: Upon reviewing recent use of conference rooms at an engineering consulting firm, an industrial engineer determined the following probability distribution for the number of requests for a conference room per half-day:

x	$f(x)$
0	.07
1	.15
2	.45
3	.25
4	.08

a) Currently, the building has two conference rooms. What is the probability that the number of requests will exceed the number of rooms for a given half-day?
b) What is the probability that the two conference rooms will not be fully utilized on a given half-day?
c) How many additional conference rooms are required so that the probability of denying a request is not more than 0.10?

Q2: Refer to Q1 and obtain the (a) mean; (b) variance; (c) standard deviation for the number of requests for conference rooms.

Q3: In 16 experiments studying the electrical behavior of single cells, 12 use micro-electrodes made of metal and the other 4 use micro-electrodes made from glass tubing. If 2 of the experiments are to be terminated for financial reasons, and they are selected at random, what are the probabilities that

a) neither uses micro-electrodes made from glass tubing?
b) only one uses micro-electrodes made from glass tubing?
c) both use micro-electrodes made from glass tubing?

Q4: During an assembly process, parts arrive just as they are needed. However, at one station, the probability is 0.01 that a defective part will arrive in a one-hour period. Find the probability that

a) exactly 1 defective part arrives in a 4-hour span;
b) 1 or more defective parts arrive in a 4-hour span;
c) exactly 1 defective part arrives in a 4-hour span and exactly 1 defective part arrives in the next 4-hour span.

Q5: An automated weight monitor can detect under-filled cans of beverages with probability 0.98. What is the probability it fails to detect an under-filled can for the first time when it encounters the 10th under-filled can?

Q6: The probability that the noise level of a wide-band amplifier will exceed 2 dB is 0.05. Find the probabilities that among 12 such amplifiers the noise level of

a) one will exceed 2 dB;
b) at most two will exceed 2 dB;
c) two or more will exceed 2 dB.

Q7: A company manufactures hydraulic gears, and records show that the probability is 0.04 that one of its new gears will fail its inspection test. What is the probability that the fifth gear in a day will be the first one to fail the test?