HW ON STAT 319, TERM 121 ON DISCRETE PROBABILITY MODELS, DUE 29 SEP

C.1 The probability that a bit transmitted through a digital transmission channel is received in error (E) is 0.10. Assume that the transmissions are independent events.

a. What is the probability that the first two bits are received correctly but the last two are in error?

b. What is the probability that any two of the four bits is received correctly if we transmit 5 bits?

c. What is the probability that at least 2 of the four bits are received are in error?

d. What is the mean number of transmissions until the first error?

e. What is the probability that the first wrong transmission occurred on the 5^{th} trial?

f. What is the probability that more than 5 bits are transmitted before a transmission received in error?

(cf. Motgomery, Douglas C. 2011, 88)

C.2 Suppose that 50% (p) items are defective in a production process.

a. If10 are selected for inspection, what is the expected number of defective items in the sample?

b. If n items are selected for inspection, what is the expected number of defective items in the sample?

c. If n items are selected for inspection, and the probability that any item is defective is p, which is not necessarily 50%, what is the expected number of defective items in the sample?

d. If 10 items are selected for inspection, what is the probability that half of them will be defective?

C.3 A batch of parts contains 100 parts from a local supplier of tubing and 200 parts from a supplier of tubing in the next state.

a. If four parts are selected randomly and with replacement, what is the probability that they all are from the local supplier?

b. If the sampling were without replacement, and four are selected , what is the probability that they all are from the local supplier?

c. What are the mean number of parts selected from the local supplier?

(cf. Motgomery, Douglas C. 2011, 94)

C.4 Contamination is a problem in the manufacture of optical storage disks (CDs). The number of particles of contamination that occur on an optical disk has a Poisson distribution, and the average number of particles per centimeter squared of media surface is 0.10. The area of a disk under study is 100 squared centimeters. What is the probability that 12 particles occur in the area of a disk under study?

(cf. Motgomery, Douglas C. 2011, 100)