

## Home Works for Chapter 5

**Problem1.** If the probability that a fluorescent light has a useful life of at least 500 hours is 0.85, find the probabilities that among 20 such lights

- a. 18 will have a useful life of at least 500 hours.
- b. At least 15 will have a useful life of at least 500 hours.
- c. At most 10 will not have a useful life of at least 500 hours.

**Problem2.** Suppose that 20% of all copies of a particular textbook fail a certain binding strength test. Let  $X$  denote the number among 15 randomly selected copies that fail the test.

- a. What is the distribution of  $X$  ?
- b. Draw the probability and cumulative probability histograms.
- c. Find the probability that exactly 8 fail the test.
- d. Find the probability that between 4 and 7, inclusive, fail the test.

**Problem3.** In the inspection of tinplate produced by a continuous electrolytic process, 0.2 imperfections are spotted on the average per minute. Find the probabilities of spotting

- a. One imperfection in 3 minutes.
- b. At least 2 imperfections in 5 minutes.
- c. At most one imperfection in 15 minutes.

**Problem4.** A foundry ships engine blocks in lots of 20. Three items are selected and tested. If the lot actually contains five defective items, find the probability that there will be at least 2 defective blocks in the sample?

**Problem5.** Each of 12 refrigerators of a certain type has been returned to a distributor because of the presence of a high-pitched oscillating noise when the refrigerator ironing. Suppose that 5 of these 12 have defective compressors and the other 7 have less serious problems. If they are examined in random order, let  $X$  = the number among the first 6 examined that have a defective compressor. Compute the following probabilities:

- a.  $P(X = 1)$
- b.  $P(X \geq 4)$
- c.  $P(1 \leq X \leq 3)$