

## HA-2

1. Long term average number of computer failure in your organization is 2 per week. What is the probability of exactly 3 failures in one week? What is the probability of at most one failure in the next week?
2. A cell phone is made by assembling 55 components. Each component has a 0.002 probability of being defective. What is the probability that a cell phone picked at random will not work perfectly?
3. A sequence of independent trials is to be conducted in a lab. The trials are independent of each other and each has a success probability 'p'. What is the probability that at least one success occurs in first 'n' trials?
4. A clothing store has historically found that 30% of the people who enter the store make a purchase. Eight people enter the store during a one-hour period. Find the probability that
  - a. Exactly four people will make a purchase
  - b. At least one person will make a purchase.
5. The payroll department of a company has found that in one year, 0.9% of its paychecks are calculated incorrectly. The company has 500 employees. What is the probability that in one month's records no paycheck errors are made?
6. The manager of an industrial plant is planning to buy a machine of either type A or type B. For each day's operation the number of repairs  $X$ , that the machine 'A' needs is a Poisson random variable with mean 0.96. The daily cost of operating A is  $C_A = 160 + 40X^2$ . For machine 'B', let  $Y$  be the random variable indicating the number of daily repairs, which has mean 1.12, and the daily cost of operating B is  $C_B = 128 + 40Y^2$ . Assume that the repairs take negligible time and each night the machine are cleaned so that they operate like new machine at the start of each day. Which machine minimizes the expected daily cost?
7. Suppose that 12 inquiries per minute arrive at a interactive system. Find the probability of 10 inquiries arriving in a 1-minute interval.