

STAT 324 HOME WORK 2 (covers chapter 5)

To be assigned during week (18-5-143 to 22-5-1434)

Due in the lab during week (25-5-1434 to 29-5-1434)

1. An employee is selected from a staff of 10 to supervise a certain project by selecting a tag at random from a box containing 10 tags numbered from 1 to 10. Find the formula for the probability distribution of X representing the number on the tag that is drawn.
 - (a) what is the probability that the number drawn is less than 4?;
 - (b) find the mean and variance of the random variable X .
2. In a certain city district the need for money to buy drugs is given as the reason 75% of all thefts. Find the probability that among the next 5 thefts . cases reported in this district
 - (a) exactly 2 resulted from the need for money to buy drugs;
 - (b) at most 3 resulted from the need for money to buy drugs.
3. A traffic control engineer reports that 75% of the vehicles passing through a check point are from within the state. What is the probability that fewer than 4 of the next 9 vehicles are from out of the state?
4. A survey of the residents in a United states city showed that 20% preferred a white telephone over any other color available. For the next 20 telephones installed in this city
 - (a) what is the probability that more than half of them will be white?
 - (b) find the mean and variance of the number of a white telephone.
5. A homeowner plants 6 bulbs selected at random from a box containing 5 tulip bulbs and 4 daffodil bulbs. What is the probability that he planted 2 daffodil bulbs and 4 tulip bulbs?
6. A random committee of size 3 is selected from 4 doctors and 2 nurses.
 - (a) write a formula for the probability distribution of the random variable X representing the number of doctors on the committee.
 - (b) find $P(2 \leq X \leq 3)$.

7. A manufacturing company uses an acceptance scheme on production items before they are shipped. The plan is a two-stage one. Boxes of 25 are readied for shipment and a sample of 3 are tested for defectives. If any defectives are found, the entire box is sent back for 100% screening. If no defectives are found, the box is shipped.
- (a) what is the probability that a box containing 3 defectives will be shipped?
 - (b) what is the probability that a box containing only 1 defective will be sent back for screening?
8. In an inventory study it was determined that, on the average, demands for a particular item at a warehouse were made 5 times per day. What is the probability that on a given day this item is requested
- (a) more than 5 times?
 - (b) not at all?
9. The average number of field mice per acre in a 5-acre wheat field is estimated to be 12. Find the probability that fewer than 7 field mice are found
- (a) on a given acre;
 - (b) on 2 of the next 3 acres inspected.
10. Suppose that on the average 1 person in 1000 makes a numerical error in preparing his or her income tax return. If 10,000 forms are selected at random and examined, find the probability that 6, 7 or 8 of the forms will be in error.