DISCRETE PROBABILITY DISTRIBUTIONS

MULTIPLE CHOICE QUESTIONS

In the following multiple-choice questions, circle the correct answer.

1.   A numerical description of the outcome of an experiment is called a
      a.   descriptive statistic
      b.   probability function
      c.   variance
      d.   random variable

2..   Variance is
      a.   a measure of the average, or central value of a random variable
      b.   a measure of the dispersion of a random variable
      c.   the square root of the standard deviation
      d.   the sum of the squared deviation of data elements from the mean

3.   A continuous random variable may assume
      a.   any value in an interval or collection of intervals
      b.   only integer values in an interval or collection of intervals
      c.   only fractional values in an interval or collection of intervals
      d.   only the positive integer values in an interval

4.   A description of the distribution of the values of a random variable and their
      associated probabilities is called a
      a.   probability distribution
      b.   random variance
      c.   random variable
      d.   expected value

5.   Which of the following is a required condition for a discrete probability function?
      a. $\Sigma f(x) = 0$

      b. $f(x) \geq 1$ for all values of x

      c. $f(x) < 0$

      d. $\Sigma f(x) = 1$

6. A measure of the average value of a random variable is called a(n)
    a. variance
    b. standard deviation
    c. expected value
    d. coefficient of variation

7. The standard deviation is the
    a. variance squared
    b. square root of the sum of the deviations from the mean
    c. same as the expected value
    d. positive square root of the variance

8. Exhibit 5-1
The following represents the probability distribution for the daily demand of microcomputers at a local store.

Demand	Probability
0	0.1
1	0.2
2	0.3
3	0.2
4	0.2

9. Refer to Exhibit 5-1. The expected daily demand is
    a. 1.0
    b. 2.2
    c. 2, since it has the highest probability
    d. of course 4, since it is the largest demand level

10. Refer to Exhibit 5-1. The probability of having a demand for at least two microcomputers is
    a. 0.7
    b. 0.3
    c. 0.4
    d. 1.0

Exhibit 5-2
The student body of a large university consists of 60% female students. A random sample of 8 students is selected.

11. Refer to Exhibit 5-2. What is the probability that among the students in the sample exactly two are female?
    a. 0.0896
    b. 0.2936
    c. 0.0413
    d. 0.0007

12. Refer to Exhibit 5-2. What is the probability that among the students in the sample at least 7 are female?
   a. 0.1064
   b. 0.0896
   c. 0.0168
   d. 0.8936

13. Refer to Exhibit 5-2. What is the probability that among the students in the sample at least 6 are male?
   a. 0.0413
   b. 0.0079
   c. 0.0007
   d. 0.0499

14. An experiment consists of making 80 telephone calls in order to sell a particular insurance policy. The random variable in this experiment is a
   a. discrete random variable
   b. continuous random variable
   c. complex random variable
   d. simplex random variable

15. An experiment consists of determining the speed of automobiles on a highway by the use of radar equipment. The random variable in this experiment is a
   a. discrete random variable
   b. continuous random variable
   c. complex random variable
   d. simplex random variable

16. The number of electrical outages in a city varies from day to day. Assume that the number of electrical outages (x) in the city has the following probability distribution.

x	f(x)
0	0.80
1	0.15
2	0.04
3	0.01

The mean and the standard deviation for the number of electrical outages (respectively) are

   a. 2.6 and 5.77
   b. 0.26 and 0.577
   c. 3 and 0.01
   d. 0 and 0.8

Exhibit 5-4
Forty percent of all registered voters in a national election are female. A random sample of 5 voters is selected.

17.   Refer to Exhibit 5-4. The probability that the sample contains 2 female voters is
        a. 0.0778
        b. 0.7780
        c. 0.5000
        d. 0.3456

18.   Refer to Exhibit 5-4. The probability that there are no females in the sample is
        a. 0.0778
        b. 0.7780
        c. 0.5000
        d. 0.3456

19.   The weight of an object is an example of
        a. a continuous random variable
        b. a discrete random variable
        c. either a continuous or a discrete random variable, depending on the weight of the object
        d. either a continuous or a discrete random variable depending on the units of measurement

20.   Which of the following statements about a discrete random variable and its probability distribution are true?
        a. Values of the random variable can never be negative.
        b. Some negative values of f(x) are allowed as long as $\Sigma f(x) = 1$.
        c. Values of f(x) must be greater than or equal to zero.
        d. The values of f(x) increase to a maximum point and then decrease.

21.   In the textile industry, a manufacturer is interested in the number of blemishes or flaws occurring in each 100 feet of material. The probability distribution that has the greatest chance of applying to this situation is the
        a. normal distribution
        b. binomial distribution
        c. Poisson distribution
        d. uniform distribution

22.   The expected value of a discrete random variable
        a. is the most likely or highest probability value for the random variable
        b. will always be one of the values x can take on, although it may not be the highest probability value for the random variable
        c. is the average value for the random variable over many repeats of the experiment

d. None of these alternatives is correct.

23. Which of the following is not a characteristic of an experiment where the binomial probability distribution is applicable?
a. the experiment has a sequence of n identical trials
b. exactly two outcomes are possible on each trial
c. the trials are dependent
d. the probabilities of the outcomes do not change from one trial to another

24. Which of the following is a characteristic of a binomial experiment?
a. at least 2 outcomes are possible
b. the probability changes from trial to trial
c. the trials are independent
d. None of these alternatives is correct.

25. The expected value of a random variable is
a. the value of the random variable that should be observed on the next repeat of the experiment
b. the value of the random variable that occurs most frequently
c. the square root of the variance
d. None of these alternatives is correct.

26. In a binomial experiment
a. the probability does not change from trial to trial
b. the probability does change from trial to trial
c. the probability could change from trial to trial, depending on the situation under consideration
d. None of these alternatives is correct.

27. Assume that you have a binomial experiment with $p = 0.5$ and a sample size of 100. The expected value of this distribution is
a. 0.50
b. 0.30
c. 100
d. 50

28. Which of the following is not a property of a binomial experiment?
a. the experiment consists of a sequence of n identical trials
b. each outcome can be referred to as a success or a failure
c. the probabilities of the two outcomes can change from one trial to the next
d. the trials are independent

29. The standard deviation of a binomial distribution is
a. $E(x) = P(1 - P)$
b. $E(x) = nP$
c. $E(x) = nP(1 - P)$

d.   None of these alternatives is correct.

30.   The expected value for a binomial probability distribution is
    a. $E(x) = Pn(1 - n)$
    b. $E(x) = P(1 - P)$
    c. $E(x) = nP$
    d. $E(x) = nP(1 - P)$

31.   The variance for the binomial probability distribution is
    a. $var(x) = P(1 - P)$
    b. $var(x) = nP$
    c. $var(x) = n(1 - P)$
    d. $var(x) = nP(1 - P)$

32.   A production process produces 2% defective parts. A sample of five parts from the production process is selected. What is the probability that the sample contains exactly two defective parts?
    a.   0.0004
    b.   0.0038
    c.   0.10
    d.   0.02

33.   Assume that you have a binomial experiment with $p = 0.4$ and a sample size of 50. The variance of this distribution is
    a.   20
    b.   12
    c.   3.46
    d.   144

Exhibit
Probability Distribution

x	f(x)
10	.2
20	.3
30	.4
40	.1

34.   Refer to Exhibit 5-5. The expected value of x equals
    a.   24
    b.   25
    c.   30
    d.   100

35.   Refer to Exhibit 5-5. The variance of x equals
    a.   9.165
    b.   84

c. 85
d. 93.33

Exhibit
A sample of 2,500 people was asked how many cups of coffee they drink in the morning. You are given the following sample information.

Cups of Coffee	Frequency
0	700
1	900
2	600
3	300
	2,500

36.   Refer to Exhibit 5-6. The expected number of cups of coffee is
a. 1
b. 1.2
c. 1.5
d. 1.7

37.   Refer to Exhibit 5-6. The variance of the number of cups of coffee is
a. 0.96
b. 0.9798
c. 1
d. 2.4

Exhibit
The probability that Pete will catch fish when he goes fishing is .8. Pete is going to fish 3 days next week. Define the random variable X to be the number of days Pete catches fish.

38.   Refer to Exhibit 5-7. The probability that Pete will catch fish on exactly one day is
a. 0.008
b. 0.096
c. 0.104
d. 0.8

39.   Refer to Exhibit 5-7. The probability that Pete will catch fish on one day or less is
a. 0.008
b. 0.096
c. 0.104
d. 0.8

40.   Refer to Exhibit 5-7. The expected number of days Pete will catch fish is
a. 0.6

b. 0.8
c. 2.4
d. 3

41. Refer to Exhibit 5-7. The variance of the number of days Pete will catch fish is
   a. 0.16
   b. 0.48
   c. 0.8
   d. 2.4

42. In a binomial experiment the probability of success is 0.06. What is the probability of two successes in seven trials?
   a. 0.0036
   b. 0.0600
   c. 0.0555
   d. 0.2800

43. X is a random variable with the probability function:
   $f(X) = X/6$ for X = 1,2 or 3
   The expected value of X is
   a. 0.333
   b. 0.500
   c. 2.000
   d. 2.333

Exhibit 5-9
The probability distribution for the daily sales at Michael's Co. is given below.

Daily Sales (In $1,000s)	Probability
40	0.1
50	0.4
60	0.3
70	0.2

44. Refer to Exhibit 5-9. The expected daily sales are
   a. $55,000
   b. $56,000
   c. $50,000
   d. $70,000

45. Refer to Exhibit 5-9. The probability of having sales of at least $50,000 is
   a. 0.5
   b. 0.10
   c. 0.30
   d. 0.90

Exhibit 5-10
The probability distribution for the number of goals the Lions soccer team makes per game is given below.

Number Of Goals	Probability
0	0.05
1	0.15
2	0.35
3	0.30
4	0.15

46.   Refer to Exhibit 5-10. The expected number of goals per game is
a.   0
b.   1
c.   2, since it has the highest probability
d.   2.35

47.   Refer to Exhibit 5-10. What is the probability that in a given game the Lions will score at least 1 goal?
a.   0.20
b.   0.55
c.   1.0
d.   0.95

48.   Refer to Exhibit 5-10. What is the probability that in a given game the Lions will score less than 3 goals?
a.   0.85
b.   0.55
c.   0.45
d.   0.80

49.   Refer to Exhibit 5-10. What is the probability that in a given game the Lions will score no goals?
a.   0.95
b.   0.05
c.   0.75
d.   0.60

Exhibit 5-11
A local bottling company has determined the number of machine breakdowns per month and their respective probabilities as shown below:

Number of Breakdowns	Probability
0	0.12
1	0.38
2	0.25

3	0.18
4	0.07

50. Refer to Exhibit 5-11. The expected number of machine breakdowns per month is
   a. 2
   b. 1.70
   c. one, since it has the highest probability
   d. at least 4

51. Refer to Exhibit 5-11. The probability of at least 3 breakdowns in a month is
   a. 0.5
   b. 0.10
   c. 0.30
   d. 0.90

52. Refer to Exhibit 5-11. The probability of no breakdowns in a month is
   a. 0.88
   b. 0.00
   c. 0.50
   d. 0.12

PROBLEMS

1.   Thirty two percent of the students in a management class are graduate students. A random sample of 5 students is selected. Using the binomial probability function, determine the probability that the sample contains exactly 2 graduate students?
        Answer: 0.322 (rounded)

2.   Seventy percent of the students applying to a university are accepted. Using the binomial probability tables, what is the probability that among the next 18 applicants
        a. At least 6 will be accepted?
        b. Exactly 10 will be accepted?
        c. Exactly 5 will be rejected?
        d. Fifteen or more will be accepted?
        e. Determine the expected number of acceptances
        f. Compute the standard deviation.

        Answers:
        a. 0.9988
        b. 0.0811
        c. 0.2017
        d. 0.1646
        e. 12.6
        f. 1.9442

3.   General Hospital has noted that they admit an average of 8 patients per hour.
        a. What is the probability that during the next hour less then 3 patients will be admitted?
        b. What is the probability that during the next two hours exactly 8 patients will be admitted?

        Answers:
        a.   0.0137
        b.   0.0120

4.   The demand for a product varies from month to month. Based on the past year's data, the following probability distribution shows MNM company's monthly demand.

x Unit Demand	f(x) Probability
0	0.10
1,000	0.10
2,000	0.30
3,000	0.40
4,000	0.10

        a. Determine the expected number of units demanded per month.

b. Each unit produced costs the company $8.00, and is sold for $10.00. How much will the company gain or lose in a month if they stock the expected number of units demanded, but sell 2000 units?

Answers:
a. 2300
b. Profit = $1600

5. Twenty-five percent of the employees of a large company are minorities. A random sample of 7 employees is selected.
   a. What is the probability that the sample contains exactly 4 minorities?
   b. What is the probability that the sample contains fewer than 2 minorities?
   c. What is the probability that the sample contains exactly 1 non-minority?
   d. What is the expected number of minorities in the sample?
   e. What is the variance of the minorities?

Answers:
a. 0.0577
b. 0.4450
c. 0.0013
d. 1.75
e. 1.3125

6. A salesperson contacts eight potential customers per day. From past experience, we know that the probability of a potential customer making a purchase is 0.10.

   a. What is the probability the salesperson will make exactly two sales in a day?
   b. What is the probability the salesperson will make at least two sales in a day?
   c. What percentage of days will the salesperson not make a sale?
   d. What is the expected number of sales per day?

Answers:
a. 0.1488
b. 0.1869
c. 43.05%
d. 0.8

7. A life insurance company has determined that each week an average of seven claims is filed in its Nashville branch.
   a. What is the probability that during the next week exactly seven claims will be filed?
   b. What is the probability that during the next week no claims will be filed?
   c. What is the probability that during the next week fewer than four claims will be filed?
   d. What is the probability that during the next week at least seventeen claims will be filed?

Answers:
a. 0.1490
b. 0.0009
c. 0.0817
d. 0.0009

8. When a particular machine is functioning properly, 80% of the items produced are non-defective. If three items are examined, what is the probability that one is defective? Use the binomial probability function to answer this question.
Answer: 0.384

9. Ten percent of the items produced by a machine are defective. Out of 15 items chosen at random,
a. what is the probability that exactly 3 items will be defective?
b. what is the probability that less than 3 items will be defective?
c. what is the probability that exactly 11 items will be non-defective?

Answers:
a. 0.1285
b. 0.816
c. 0.0428

10. The student body of a large university consists of 30% Business majors. A random sample of 20 students is selected.
a. What is the probability that among the students in the sample at least 10 are Business majors?
b. What is the probability that at least 16 are not Business majors?
c. What is the probability that exactly 10 are Business majors?
d. What is the probability that exactly 12 are not Business majors?

Answers:
a. 0.0479
b. 0.2374
c. 0.0308
d. 0.1144

11. Shoppers enter Hamilton Place Mall at an average of 120 per hour.
a. What is the probability that exactly 5 shoppers will enter the mall between noon and 12:05 p.m.?
b. What is the probability that at least 35 shoppers will enter the mall between 5:00 and 5:10 p.m.?

Answers:
a. 0.0378
b. 0.0015

12. A production process produces 90% non-defective parts. A sample of 10 parts from the production process is selected.
    a. What is the probability that the sample will contain 7 non-defective parts?
    b. What is the probability that the sample will contain at least 4 defective parts?
    c. What is the probability that the sample will contain less than 5 non-defective parts?
    d. What is the probability that the sample will contain no defective parts?

    Answers:
    a. 0.0574
    b. 0.0128
    c. 0.0001
    d. 0.3487

13. Fifty-five percent of the applications received for a particular credit card are accepted. Among the next twelve applications,
    a. what is the probability that all will be rejected?
    b. what is the probability that all will be accepted?
    c. what is the probability that exactly 4 will be accepted?
    d. what is the probability that fewer than 3 will be accepted?
    e. Determine the expected number and the variance of the accepted applications.

    Answers:
    a. 0.0001
    b. 0.0008
    c. 0.0762
    d. 0.0079
    e. 6.60; 2.9700

14. The probability distribution of the daily demand for a product is shown below.

Demand	Probability
0	0.05
1	0.10
2	0.15
3	0.35
4	0.20
5	0.10
6	0.05

    a. What is the expected number of units demanded per day?
    b. Determine the variance and the standard deviation.

    Answers:
    a. 3.05
    b. variance = 2.0475 std. dev. = 1.431

15. In a large corporation, 65% of the employees are male. A random sample of five employees is selected. Use the Binomial probability to answer the following questions.
   a. What is the probability that the sample contains exactly three male employees?
   b. What is the probability that the sample contains no male employees?
   c. What is the probability that the sample contains more than three female employees?
   d. What is the expected number of female employees in the sample?

   Answers:
   a. 0.3364
   b. 0.0053
   c. 0.0541
   d. 1.75

16. For the following probability distribution:

x	f(x)
0	0.01
1	0.02
2	0.10
3	0.35
4	0.20
5	0.11
6	0.08
7	0.05
8	0.04
9	0.03
10	0.01

   a. Determine E(x).
   b. Determine the variance and the standard deviation.

   Answers:
   a. 4.14
   b. variance = 3.7   std. dev. = 1.924

17. A random variable x has the following probability distribution:

x	f(x)
0	0.08
1	0.17
2	0.45
3	0.25
4	0.05

a. Determine the expected value of x.
b. Determine the variance.

Answers:
a. 2.02
b. 0.9396

18. A company sells its products to wholesalers in batches of 1,000 units only. The daily demand for its product and the respective probabilities are given below.

Demand (Units)	Probability
0	0.2
1000	0.2
2000	0.3
3000	0.2
4000	0.1

a. Determine the expected daily demand.
b. Assume that the company sells its product at $3.75 per unit. What is the expected daily revenue?

Answers:
a. 1800
b. $6,750

19. The records of a department store show that 20% of its customers who make a purchase return the merchandise in order to exchange it. In the next six purchases,
a. what is the probability that three customers will return the merchandise for exchange?
b. what is the probability that four customers will return the merchandise for exchange?
c. what is the probability that none of the customers will return the merchandise for exchange?

Answers:
a. 0.0819
b. 0.0154
c. 0.2621

20. In a large university, 15% of the students are female. If a random sample of twenty students is selected,
a. what is the probability that the sample contains exactly four female students?
b. what is the probability that the sample will contain no female students?
c. what is the probability that the sample will contain exactly twenty female students?
d. what is the probability that the sample will contain more than nine female

students?
e. what is the probability that the sample will contain fewer than five female students?
f. what is the expected number of female students?

Answers:
a. 0.1821
b. 0.0388
c. 0.0000
d. 0.0002
e. 0.8298
f. 3

21. In a southern state, it was revealed that 5% of all automobiles in the state did not pass inspection. Of the next ten automobiles entering the inspection station,
a. what is the probability that none will pass inspection?
b. what is the probability that all will pass inspection?
c. what is the probability that exactly two will not pass inspection?
d. what is the probability that more than three will not pass inspection?
e. what is the probability that fewer than two will not pass inspection?
f. Find the expected number of automobiles not passing inspection.
g. Determine the standard deviation for the number of cars not passing inspection.

Answers:
a. 0.0000
b. 0.5987
c. 0.0746
d. 0.0011
e. 0.9138
f. 0.5
g. 0.6892

22. The random variable x has the following probability distribution:

x	f(x)
0	.25
1	.20
2	.15
3	.30
4	.10

a. Is this probability distribution valid? Explain and list the requirements for a valid probability distribution.
b. Calculate the expected value of x.
c. Calculate the variance of x.
d. Calculate the standard deviation of x.

Answers:

a. yes $f(x) \geq 0$ and $\Sigma f(x) = 1$
b. 1.8
c. 1.86
d. 1.364

23. The probability function for the number of insurance policies John will sell to a customer is given by

$$f(X) = .5 - (X/6) \quad \text{for } X = 0, 1, \text{ or } 2$$

a. Is this a valid probability function? Explain your answer.
b. What is the probability that John will sell exactly 2 policies to a customer?
c. What is the probability that John will sell at least 2 policies to a customer?
d. What is the expected number of policies John will sell?
e. What is the variance of the number of policies John will sell?

Answers:

a. yes $f(x) \geq 0$ and $\Sigma f(x) = 1$
b. 0.167
c. 0.167
d. 0.667
e. 0.556

24. The probability distribution for the rate of return on an investment is

Rate of Return (In Percent)	Probability
9.5	.1
9.8	.2
10.0	.3
10.2	.3
10.6	.1

a. What is the probability that the rate of return will be at least 10%?
b. What is the expected rate of return?
c. What is the variance of the rate of return?

Answers:
a. 0.7
b. 10.03
c. 0.0801

25. In a large university, 75% of students live in dormitories. A random sample of 5 students is selected. Use the binomial probability tables to answer the following questions.

a. What is the probability that the sample contains exactly three students who live in the dormitories?
b. What is the probability that the sample contains no students who lives in the dormitories?
c. What is the probability that the sample contains more than three students who do not live in the dormitories?
d. What is the expected number of students (in the sample) who do not live in the dormitories?

Answers:
a. 0.2637
b. 0.001
c. 0.0156
d. 1.25

26. A manufacturing company has 5 identical machines that produce nails. The probability that a machine will break down on any given day is .1. Define a random variable X to be the number of machines that will break down in a day.
a. What is the appropriate probability distribution for X? Explain how X satisfies the properties of the distribution.
b. Compute the probability that 4 machines will break down.
c. Compute the probability that at least 4 machines will break down.
d. What is the expected number of machines that will break down in a day?
e. What is the variance of the number of machines that will break down in a day?

Answers:
a. binomial
b. 0.00045
c. 0.00046
d. 0.5
e. 0.45

27. On the average, 6.7 cars arrive at the drive-up window of a bank every hour. Define the random variable X to be the number of cars arriving in any hour.
a. What is the appropriate probability distribution for X? Explain how X satisfies the properties of the distribution.
b. Compute the probability that exactly 5 cars will arrive in the next hour.
c. Compute the probability that no more than 5 cars will arrive in the next hour.

Answers:
a. Poisson; it shows the probability of x occurrences of the event over a time period.
b. 0.1385
c. 0.3406

28. Twenty-five percent of all resumes received by a corporation for a management position are from females. Fifteen resumes will be received tomorrow.
   a. What is the probability that exactly 5 of the resumes will be from females?
   b. What is the probability that fewer than 3 of the resumes will be from females?
   c. What is the expected number of resumes from women?
   d. What is the variance of the number of resumes from women?

   Answers:
   a. 0.1651
   b. 0.2361
   c. 3.75
   d. 2.8125

29. The average number of calls received by a switchboard in a 30-minute period is 15.
   a. What is the probability that between 10:00 and 10:30 the switchboard will receive exactly 10 calls?
   b. What is the probability that between 10:00 and 10:30 the switchboard will receive more than 9 calls but fewer than 15 calls?
   c. What is the probability that between 10:00 and 10:30 the switchboard will receive fewer than 7 calls?

   Answers:
   a. 0.0486
   b. 0.3958
   c. 0.0075

30. Two percent of the parts produced by a machine are defective. Twenty parts are selected at random. Use the binomial probability tables to answer the following questions.
   a. What is the probability that exactly 3 parts will be defective?
   b. What is the probability that the number of defective parts will be more than 2 but fewer than 6?
   c. What is the probability that fewer than 4 parts will be defective?
   d. What is the expected number of defective parts?
   e. What is the variance for the number of defective parts?

   Answers:
   a. 0.0065
   b. 0.0071
   c. 0.9940
   d. 0.4
   e. 0.392

35. An insurance company has determined that each week an average of nine claims are filed in their Atlanta branch. What is the probability that during the next week

a. exactly seven claims will be filed?
b. no claims will be filed?
c. less than four claims will be filed?
d. at least eighteen claims will be filed?

Answers:
a. 0.1171
b. 0.0001
c. 0.0212
d. 0.0053

36. A local university reports that 10% of their students take their general education courses on a pass/fail basis. Assume that fifteen students are registered for a general education course.
   a. What is the expected number of students who have registered on a pass/fail basis?
   b. What is the probability that exactly five are registered on a pass/fail basis?
   c. What is the probability that more than four are registered on a pass/fail basis?
   d. What is the probability that less than two are registered on a pass/fail basis?

   Answers:
   a. 1.5
   b. 0.01050
   c. 0.0172
   d. 0.5491

37. Only 0.02% of credit card holders of a company report the loss or theft of their credit cards each month. The company has 15,000 credit cards in the city of Memphis. Use the Poisson probability to answer the following questions. What is the probability that during the next month in the city of Memphis
   a. no one reports the loss or theft of their credit cards?
   b. every credit card is lost or stolen?
   c. six people report the loss or theft of their cards?
   d. at least nine people report the loss or theft of their cards?
   e. Determine the expected number of reported lost or stolen credit cards.
   f. Determine the standard deviation for the number of reported lost or stolen cards.

   Answers:
   a. 0.0498
   b. 0.0000
   c. 0.0504
   d. 0.0038
   e. 3
   f. 1.73

38.   A production process produces 2% defective parts. A sample of 5 parts from the production is selected. What is the probability that the sample contains exactly two defective parts? Use the binomial probability function and show your computations to answer this question.

Answer: 0.0037648

39.   A retailer of electronic equipment received six VCRs from the manufacturer. Three of the VCRs were damaged in the shipment. The retailer sold two VCRs to two customers.
a   Can a binomial formula be used for the solution of the above problem?
b.   What kind of probability distribution does the above satisfy, and is there a function for solving such problems?
c.   What is the probability that both customers received damaged VCRs?
d.   What is the probability that one of the two customers received a defective VCR?

Answers:
a.   No, in a binomial experiment, trials are independent of each other.
b.   Hypergeometric probability distribution
c.   0.2
d.   0.6