1.   The delivery of an item of raw material from a supplier may take up to 6 weeks from the time the order is placed. The probability of delivery times is as follows:

Delivery Time	Probability
less than 1 week	0.1
1 – 2	0.25
2 – 3	0.20
3 – 4	0.20
4 – 5	0.15
5 – 6	0.10

What is the probability that a delivery will take
(a)   two weeks or less?
(b)   more than 3 weeks?

2.   A company known that the probability of obtaining zero complaint is 0.1, whilst the probability of obtaining 1 complaint in the sample is 0.4. What is the probability of
(a)   obtaining not more than 1 complaint in a sample?
(b)   obtaining more than 1 complaint in a sample?

3.   A class known that the probability of obtaining zero failure rate is 0.1, and the probability of obtaining 1 student fails and 2 students fail are 0.2 and 0.25 respectively. Find the probability of
(a)   obtaining not more than 1 student fails.
(b)   obtaining not more than 2 students fail.
(c)   obtaining more than 2 students fail.

4.   A large basket of fruit contains 3 oranges, 2 apples, and 5 bananas. If a piece of fruit is chosen at random, what is the probability of getting an orange or a banana?

5.   In the United States, 43% of people wear a seat belt while driving. If two people are chosen at random, what is the probability that both of them wear a seat belt?

6.   In a shipment of 100 televisions, 6 are defective. If a person buys two televisions, what is the probability that both are defective?

7.   The probability that a student fails Mathematics is 0.3 and the probability that he or she fails Sciences is 0.6. If the probability that he or she fails at least one subject is 0.65, what is the probability that he or she will fail both subjects?

8.   The probability that a student pass English is 0.7 and the probability that he or she pass Accounting is 0.3. Given that the probability that he or she pass both subject is 0.2, what is the probability that he or she passes at least one subject?

9.   Machine A produced 15 of the day's output of Barbie dolls and machine B produced the other 5. If two Barbie dolls are selected at random from the day's output, find the probability that:
(a)   they both came from the same machine A
(b)   they both came from the same machine
(c)   there was one from each machine

10.   A company tenders for 2 contracts, A and B. The probability that it will obtain contract A is 1/3 and the probability that it will obtain contract B is ¼. Find the probability that the company

    (a)   will obtain both contracts

    (b)   will obtain only one contract

11.   A box contains 80 balls of which 12 are red balls. A person selects 6 balls from the box. Find the expected number of red balls drawn.

12.   A class which has 50 students of which 6 students are foreigner. If 4 students are selected from the class, find the expected number of a foreign student is selected.

13.   A sample of 30 students was randomly surveyed and the following information was recorded in the given contingency table.

Sex	Course		
	IT	Accounting	Business
Male	6	3	4
Female	4	8	5

What is the probability that the sex of student is male given that the course is accounting?

14.   A sample of 50 students was randomly surveyed and the following information was recorded in the given contingency table.

Sex	Favourite Subject		
	Mathematics	Sciences	History
Male	10	8	7
Female	6	9	10

What is the probability that the sex of student is female given that the favourite subject is History?

15.   In a group of 200 school students, 135 are enrolled in sciences classes, 110 are enrolled in accounting classes, and 88 are enrolled in both of the classes.
    (a)   Draw a suitable Venn diagram and fill in the numbers associated with the various regions.

    (b)   Using the Venn diagram, find how many of these students are not enrolled in either class.

16.   In a survey of 100 children, it is found that 47 have at least one brother, 58 have at least one sister and that 32 children have both. How many of the children have no brothers and sisters?

17.   If a group of people contains 30 men and 70 women. Of whom 10 men disagree with the proposition, and 40 women disagree with the proposition . Find the probability of a person who is either a man, or disagree?

18.   In a class of 30 students, there are 17 girls and 13 boys. A total of 5 students made an A grade on their report card, three of which were girls. If a student is chosen at random, what is the probability of getting a girl or an A student?

19.   A bag contains 20 balls of which 8 are red and 12 yellow. Three balls are drawn at random from the bag, what is the probability that they are all red if drawing is
    (a)   with replacement

(b)   without replacement

20.   A factory has a machine shop in which three machines (A, B and C) produce aluminium tubes. An inspector is equally likely to sample tubes from A and B, and three times as likely to select tubes from machine C as he is from B. The defective rates from these machines are A (10%); B(10%); C(20%). What is the probability that a tube selected by the inspector
        (a)   is from machine A
        (b)   is defective
        (c)   comes from machine A, given that it is defective?

21.   Your company decides to invite tenders for the supply of equipment for a new office. The company divides the equipment into three groups. Group A is office furniture (desks, chairs, etc). Group B is information technology (word processors, computers, etc). Group C is other equipment (filing cabinets, waste paper baskets, etc) .In response, 26 firms tender for group A, 17 tender for group B, and 20 tender from group C. Of these firms, 5 tender for both group A and B but not C; 4 tender for both B and C but not A; 2 tender for A and C but not B; 3 firms tender for all 3 groups.
        (a)   How many firms tendered for one or more groups?
        (b)   How many firms tendered for one group only?
        (c)   One of the firms that tendered for all 3 groups considers that the probability that it will secure tender A is 0.2, tender B is 0.3 and tender C is 0.1. Find the probability that the firm
                (i)   will obtain all 3 contracts
                (ii)   will obtain only 1 contract

22.   A large company normally recruits 20 accountancy trainees per annum. In 1978, 90 applicants were received and of these
                63 had previous work experience
                36 had passed the foundation stage examination
                27 had both work experience and had passed the foundation stage examination, and had been included in both the above counts.

        (a)   Prepare a Venn diagram to illustrate the above.
        (b)   What is the probability that an applicant taken at random:
                (i)   had work experience, or had passed the foundation stage examination, or had both.
                (ii)   had either work experience, or had passed the foundation examination, but not both?
        (c)   Given that the applicant must have work experience, determine the conditional probability that an applicant taken at random from this group will have passed the foundation stage examination.

Answer:

1.   (a)   0.55   (b)   0.25
2.   (a)   0.5   (b)   0.5
3.   (a)   0.3   (b)   0.55   (c)   0.45
4.   0.8
5.   0.1849
6.   1/330
7.   0.25
8.   0.8

9.   (a)   21/38
      (b)   23/38
      (c)   15/38
10.   (a)   1/12
      (b)   5/12
11.   0.9
12.   12/15
13.   3/11
14.   10/17
15.   (b)   43
16.   27
17.   0.7
18.   19/30
19.   (a)   0.064
      (b)   14/285
20.   (a)   1/5
      (b)   4/25
      (c)   1/8
21.   (a)   46
      (b)   32
      (c)   (i)   0.006   (ii)   0.398
22.   (b)   (i)   4/5   (ii)   ½
      (c)   3/7