Ex 15.1

Question 16.12 defective pens are accidentally mixed with 132 good ones. It is not possible to just look at a pen and tell whether or not it is defective. One pen is taken out at random from this lot. Determine the probability that the pen taken out is a good one.

Solution:

Number of defective pens = 12

Number of good pens = 132

Total number of pens = 12 + 132 = 144

P (the pen is good one) = $\frac{132}{144} = \frac{11}{12}$

Question 17.(i) A lot of 20 bulbs contain 4 defective ones. One bulb is drawn at random from the lot. What is the probability that this bulb is defective?

(ii) Suppose the bulb drawn in (i) is not defective and is not replaced. Now one bulb is drawn at random from the rest. What is the probability that this bulb is not defective?

Solution:

(i) Total number of outcomes

$\qquad$ = Total number of bulbs = 20

Number of favourable outcomes

$\qquad$ = Number of defective bulbs = 4

∴ P(getting a defective bulb) = $\frac{4}{20} = \frac{1}{5}$.

(ii) When one good bulb is kept aside, the total number of outcomes = 19

Number of favourable outcomes

$\qquad$ = Number of good bulbs = 15

∴ P(getting a good bulb) = $\frac{15}{19}$.

Question 18.A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears

(i) a two digit number.   (ii) a perfect square number.   (iii) a number divisible by 5.

Solution:

Total numbers of discs = 90

(i) P (a two digit number) = $\dfrac{81}{90} = \dfrac{9}{10}$

(ii) Here, perfect square numbers are 1, 4, 9, 16, 25, 36, 49, 64, 81

P (getting a perfect square number) = $\dfrac{9}{90} = \dfrac{1}{10}$

(iii) Numbers divisible by 5 are 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90

P (getting a number divisible by 5) = $\dfrac{18}{90} = \dfrac{1}{5}$

Question 19. A child has a die whose six faces show the letters as given below:

| A | B | C | D | E | A |

The die is thrown once. What is the probability of getting
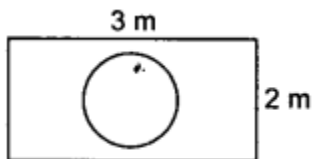(i) A?   (ii) D?

Solution:

Total number of outcomes = 6

(i) Number of favourable outcomes = 2

∴ P(getting A) = $\dfrac{2}{6} = \dfrac{1}{3}$.

(ii) Number of favourable outcomes = 1

∴ P(getting D) = $\dfrac{1}{6}$.

Question 20. Suppose you drop a die at random on the rectangular region shown in figure. What is the probability that it will land inside the circle with diameter 1 m?

Solution:

$$\text{Area of rectangle} = 3 \times 2 = 6 \text{ m}^2$$

$$\text{Area of circle} = \pi\left(\dfrac{1}{2}\right)^2 = \dfrac{\pi}{4} \text{ m}^2$$

$$\therefore \; P \text{ (the die drops inside the circle)} = \dfrac{\pi/4}{6} = \dfrac{\pi}{24}$$

Question 21. A lot consists of 144 ball pens of which 20 are defective and the others are good. Nuri will buy a pen if it is good, but will not buy if it is defective. The shopkeeper draws one pen at random and gives it to her. What is the probability that
(i) she will buy it?   (ii) she will not buy it?

Solution:

Total number of ballpens = 144

Number of defective ballpens = 20

Then the number of good pens = 144 – 20 = 124

(i) P(getting a good pen) $= \dfrac{124}{144} = \dfrac{31}{36}$.

(ii) P(getting a defective pen)

$$= 1 - P \text{ (getting a good pen)}$$

$$= 1 - \dfrac{31}{36} = \dfrac{5}{36}.$$

Question 22.Two dice, one blue and one grey, are thrown at the same time. Now

(i) Complete the following table:

Event: (Sum on 2 dice)	2	3	4	5	6	7	8	9	10	11	12
Probability	$\dfrac{1}{36}$						$\dfrac{5}{36}$				$\dfrac{1}{36}$

(ii) A student argues that-there are 11 possible outcomes 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12. Therefore, each of them has a probability 111. Do you agree with this argument? Justify your answer.

Solution:

(i) Total number of possible outcomes = 36

(1, 2) and (2, 1) are the favourable events of getting the sum 3.

P(sum 3) = $\dfrac{2}{36}$ = $\dfrac{1}{18}$

(1, 3) , (2, 2) and (3, 1) are the favourable events of getting the sum 4.

P(sum 4) = $\dfrac{3}{36}$ = $\dfrac{1}{12}$

(1, 4) , (2, 3), (3, 2) and (4, 1) are the favourable events of getting the sum 5.

P(sum 5) = $\dfrac{4}{36}$ = $\dfrac{1}{9}$

(1, 5) , (2, 4), (3, 3), (4, 2) and (5, 1) are the favourable events of getting the sum 6.

P (sum 6) = $\dfrac{5}{36}$

(1, 6) , (2, 5), (3, 4), (4, 3), (5, 2) and (6, 1) are the favourable events of getting the sum 7.

P(sum 7) = $\dfrac{6}{36}$ = $\dfrac{1}{6}$

(3, 6) , (4, 5), (5, 4) and (6, 3) are the favourable events of getting the sum 9.

P(sum 9) = $\dfrac{4}{36}$ = $\dfrac{1}{9}$

(4, 6) , (5, 5) and (6, 4) are the favourable events of getting the sum 10.

P(sum 10 = $\dfrac{3}{36}$ = $\dfrac{1}{12}$

(5,6) and (6,5) are the favourable events of getting the sum 11.

P(sum 11) = $\dfrac{2}{36}$ = $\dfrac{1}{18}$

(ii) No, because the outcomes as 11 different sum are not equally likely.