(v) There are 13 cards of spade.

$\therefore$ Favourable outcomes = 13

Hence, P (a spade) $= \frac{13}{52} = \frac{1}{4}$

(vi) There is only one queen of diamonds.

$\therefore$ Favourable outcome = 1

Hence, P (the queen of diamonds) $= \frac{1}{52}$

Q15. Five cards – then ten, jack, queen, king and ace of diamonds, are well-shuffled with their face downwards. One card is then picked up at random.

(i) What is the probability that the card is the queen?

(ii) If the queen is drawn and put aside, what is the probability that the second card picked up is (a) an ace? (b) a queen?

Ans. Total number of favourable outcomes = 5

(i) There is only one queen.

$\therefore$ Favourable outcome = 1

Hence, P (the queen) $= \frac{1}{5}$

(ii) In this situation, total number of favourable outcomes = 4

(a) Favourable outcome = 1

Hence, P (an ace) $= \frac{1}{4}$

(b) There is no card as queen.

$\therefore$ Favourable outcome = 0

Hence, P (the queen) $= \frac{0}{4} = 0$

Q16. 12 defective pens are accidently 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.

Ans. Total number of favourable outcomes = 132 + 12 = 144

Number of favourable outcomes = 132

Hence, P (getting a good pen) = $\frac{132}{144} = \frac{11}{12}$

Q17. (i) A lot of 20 bulbs contains 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?

Ans. (i) Total number of favourable outcomes = 20

Number of favourable outcomes = 4

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

(ii) Now total number of favourable outcomes = 20 – 1 = 19

Number of favouroable outcomes = 19 – 4 = 15

Hence P (getting a non-defective bulb) = $\frac{15}{19}$

Q18. 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.

Ans. Total number of favourable outcomes = 90

(i) Number of two-digit numbers from 1 to 90 are 90 – 9 = 81

∴ Favourable outcomes = 81

Hence, P (getting a disc bearing a two-digit number) $= \frac{81}{90} = \frac{9}{10}$

(ii) From 1 to 90, the perfect squares are 1, 4, 9, 16, 25, 36, 49, 64 and 81.

∴ Favourable outcomes = 9

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

(iii) The numbers divisible by 5 from 1 to 90 are 18.

∴ Favourable outcomes = 18

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

Q19. 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?

Ans. Total number of favourable outcomes = 6

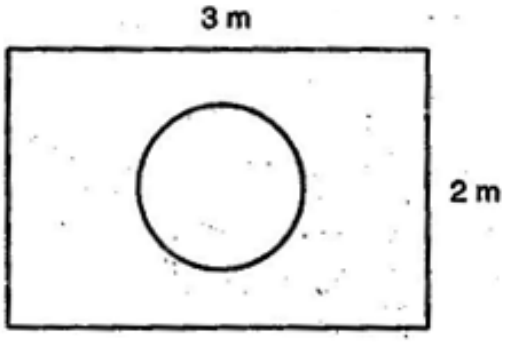
(i) Number of favourable outcomes = 2

Hence P (getting a letter A) = $\frac{2}{6} = \frac{1}{3}$

(ii) Number of favourable outcomes = 1

Hence P (getting a letter D) = $\frac{1}{6}$

Q20. Suppose you drop a die at random on the rectangular region shown in the figure given on the next page. What is the probability that it will land inside the circle with diameter 1 m?



Ans. Total area of the given figure (rectangle) = $3 \times 2 = 6\, m^2$

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

Hence, P (die to land inside the circle) = $\frac{\pi/4}{6} = \frac{\pi}{24}$

********** END **********