1.2. Basic Concepts in Probability

Exercise:

1. A die is tossed twice and the number of dots facing up is counted and noted in the order of occurrence. Let us define
   A : Total number of dots showing is even
   B : Both dice are even
   C : Number of dots in dice differ by 1
   (i) Does A imply B or does B imply B?
   (ii) Find $\mathrm{A} \cap \mathrm{C}$.

2. A desk drawer contains five pens, three of which are dry.
   (i) The pens are selected at random one by one until a good pen found. The sequence of test results is noted. What is the sample space.
   (ii) Suppose that only the number and not the sequence, of pens tested in part(i) is noted. Specify the sample space.
3. Write the sample space corresponding to each of the following random experiment.
   (i) Select a ball from an urn containing balls numbered 1 to 50. Note the number of the ball.
   (ii) Select a ball from an urn containing balls numbered 1 to 4. Suppose that balls 1 and 2 are black and balls 3 and 4 are white. Note the number and colour of the ball you select.
   (iii) Toss a coin three times and note the sequence of heads and tails.
   (iv) Toss a coin four times and note the number of tails
   (v) Count the number of voice packets containing only silence produced from a group of N speakers in a 10-mins period.
   (vi) A block of information is transmitted repeatedly over a noisy channel until an error free block arrives at the receiver. Count the number of transmissions required.
   (vii) Pick a number at random between 0 and 1.
   (viii) Measure the time between two message arrivals at a message centre.

(ix) Measure the lifetime of a given computer memory chip in a specified environment.

(x) Pick two numbers at random between 0 and 1.