**Easy :**

Q. Suppose we throw a die once. (i) What is the probability of getting a number greater than 4 ? (ii) What is the probability of getting a number less than or equal to 4 ?

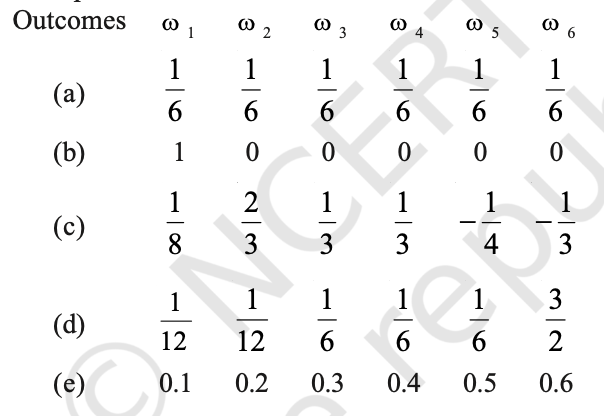
Q. A bag contains 4 white, 5 red and 6 blue balls. Three balls are drawn at random from the bag. The probability that all of them are red.

Q. In a lottery, there are 10 prizes and 25 blanks. A lottery is drawn at random. What is the probability of getting a prize?

Q. Events E and F are such that P(not E or not F) = 0.25, State whether E and F are mutually exclusive.

Q. A bag contains 2 red, 3 green and 2 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue?

Q. A fair coin with 1 marked on one face and 6 on the other and a fair die are both tossed. find the probability that the sum of numbers that turn up is (i) 3 (ii) 12

Q. Let a sample space be S = {ω1, ω2,..., ω6}.Which of the following assignments of probabilities to each outcome are valid? 

**Medium** :

Q. Harpreet tosses two different coins simultaneously (say, one is of Re 1 and other of Re 2). What is the probability that she gets *at least* one head?

Q. In a musical chair game, the person playing the music has been advised to stop playing the music at any time within 2 minutes after she starts playing. What is the probability that the music will stop within the first half-minute after starting?

Q. Two dice, one blue and one grey, are thrown at the same time. Write down all the possible outcomes. What is the probability that the sum of the two numbers appearing on the top of the dice is

(i) 8? (ii) 13? (iii) less than or equal to 12?

Q. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting (i) a king of red colour (ii) a face card (iii) a red face card (iv) the jack of hearts (v) a spade (vi) the queen of diamonds

Q. A carton consists of 100 shirts of which 88 are good, 8 have minor defects and 4 have major defects. Jimmy, a trader, will only accept the shirts which are good, but Sujatha, another trader, will only reject the shirts which have major defects. One shirt is drawn at random from the carton. What is the probability that

(i) it is acceptable to Jimmy? (ii) it is acceptable to Sujatha?

Q. A coin is tossed three times, consider the following events.  
 A: ‘No head appears’, B: ‘Exactly one head appears’ and C: ‘Atleast two heads appear’. Do they form a set of mutually exclusive and exhaustive events?

Q. Three unbiased coins are tossed. What is the probability of getting at most two heads?

Q. Two cards are drawn together from a pack of 52 cards. The probability that one is a spade and one is a heart.

**Hard :**

Q. Two players, Sangeeta and Reshma, play a tennis match. It is known that the probability of Sangeeta winning the match is 0.62. What is the probability of Reshma winning the match?

Q. Savita and Hamida are friends. What is the probability that both will have (i) different birthdays? (ii) the same birthday? (ignoring a leap year).

Q. 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? Now suppose, the bulb drawn in above question 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 ?

Q. Consider the experiment of rolling a die. Let A be the event ‘getting a prime number’, B be the event ‘getting an odd number’. Write the sets representing the events (i) Aor B (ii) A and B (iii) A but not B (iv) ‘not A’.

Q. Two dice are thrown and the sum of the numbers which come up on the dice is noted. Let us consider the following events associated with this experiment. Which pairs of these events are mutually exclusive?

A: ‘the sum is even’.  
B: ‘the sum is a multiple of 3’.

C: ‘the sum is less than 4’.  
D: ‘the sum is greater than 11’.

Q. A fair coin is tossed four times, and a person win Re 1 for each head and lose Rs 1.50 for each tail that turns up. From the sample space calculate how many different amounts of money you can have after four tosses and the probability of having each of these amounts.

Q. A and B are events such that P(A) = 0.42, P(B) = 0.48 and P(A and B) = 0.16. Determine (i) P(not A), (ii) P(not B) and (iii) P(A or B)   
   
Q. In an entrance test that is graded on the basis of two examinations, the probability of a randomly chosen student passing the first examination is 0.8 and the probability of passing the second examination is 0.7. The probability of passing atleast one of them is 0.95. What is the probability of passing both?

**Dependent and Independent Events**

Q. A die is thrown. If E is the event ‘the number appearing is a multiple of 3’ and F be the event ‘the number appearing is even’ then find whether E and F are independent ?

Q. An unbiased die is thrown twice. Let the event A be ‘odd number on the first throw’ and B the event ‘odd number on the second throw’. Check the independence of the events A and B.

Q. Prove that if E and F are independent events, then so are the events E and F′.

Q. Three coins are tossed simultaneously. Consider the event E ‘three heads or three tails’, F ‘at least two heads’ and G ‘at most two heads’. Of the pairs (E,F), (E,G) and (F,G), which are independent? which are dependent?

Q. A die marked 1,2,3 in red and 4,5,6 in green is tossed. Let A be the event, ‘the number is even,’ and B be the event, ‘the number is red’. Are A and B independent?

**Additive and Multiplicative Probability**

Q. An urn contains 10 black and 5 white balls. Two balls are drawn from the urn one after the other without replacement. What is the probability that both drawn balls are black?

Q. Three cards are drawn successively, without replacement from a pack of 52 well shuffled cards. What is the probability that first two cards are kings and the third card drawn is an ace?

Q . Out of 100 students, two sections of 40 and 60 are formed. If you and your friend are among the 100 students, what is the probability that (a) you both enter the same section?  
(b) you both enter the different sections?

Hint : Consider a bucket with 100 balls, 40 balls marked as A and 60 marked as B. Now you and your friend will pick one ball and will be assigned the section which is on the ball.

Q. Probability of solving specific problems independently by A and B are 1/2 and ⅓ respectively. If both try to solve the problem independently, find the probability that   
(i) the problem is solved (ii) exactly one of them solves the problem.

Q. In a class of 60 students, 30 opted for NCC, 32 opted for NSS and 24 opted for both NCC and NSS. If one of these students is selected at random, find the probability that  
(i) The student opted for NCC or NSS

(ii) The student has opted neither NCC nor NSS.  
(iii) The student has opted NSS but not NCC.  Hint : P(B but not A) = P(B) - P(A and B)

**Conditional Probability:**

Q. If P(A)= 7 ,P(B)= 9 andP(A∩B)= 4 ,evaluateP(A|B)

Q. Ten cards numbered 1 to 10 are placed in a box, mixed up thoroughly and then one card is drawn randomly. If it is known that the number on the drawn card is more than 3, what is the probability that it is an even number?

Q. In a school, there are 1000 students, out of which 430 are girls. It is known that out of 430, 10% of the girls study in class XII. What is the probability that a student chosen randomly studies in Class XII given that the chosen student is a girl?

Q. A die is thrown three times. Events A and B are defined as below:

A : 4 on the third throw

B : 6 on the first and 5 on the second throw  
Find the probability of A given that B has already occurred.

Q. A die is thrown twice and the sum of the numbers appearing is observed to be 6. What is the conditional probability that the number 4 has appeared at least once?

Q. Consider the experiment of tossing a coin. If the coin shows head, toss it again but if it shows tail, then throw a die. Find the conditional probability of the event that ‘the die shows a number greater than 4’ given that ‘there is at least one tail’.

Q. Assume that each born child is equally likely to be a boy or a girl. If a family has two children, what is the conditional probability that both are girls given that (i) the youngest is a girl, (ii) at least one is a girl?