



# MATHS

## NCERT - FULL MARKS MATHEMATICS(TAMIL)

## PROBABILITY

#### **Example**

1. Two coin (a one rupee coin and a two rupee coin) are tossed

once. Find a sample space.



**2.** Find a sample space associated with the experiment of rolling a

pair of dice (one is blue and other is red) once is Also, find the

number od element of this sample space.

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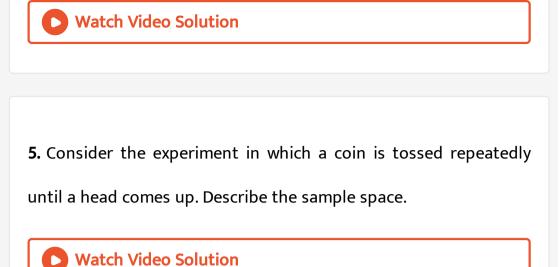
**3.** In each of the following experiments specify appropriate sample space

(i) A boy has 1 rupee coin, a 2 rupee coin and a 5 rupee coin in his pocket. He takes out two coins out of his pocket, one after the other.

(ii) A person is noting down the number of accidents along a busy highway during a year.



**4.** A coin is tossed. If it shows head, we draw a ball from a bag consisting of 3 blue and 4 white balls, if it shows tail we throw a die. Describe the sample space of this experiment.



**6.** Consider the experiment of rolling 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) A or B (ii) A and B (iii) A but not B (iv) 'not A'.



**7.** Two dice are thrown and the sum of the number which come up on the dice is noted. Let us consider the following events associated with the experiment

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'.

Which pairs of these events are mutually exclusive?



**8.** A coin is toosed three times consider the following events. A:'No head appears', B: 'Exactly one head appears' and C: 'Atleast two heads appear'.



**9.** Let a sample space be  $S=\{\omega-(1),\omega_2,...,\omega_6\}.$  Which of the

following assingments of probabilities to each outcomes are

valid?

Outcomes  $\omega_1 \quad \omega_2 \quad \omega_3 \quad \omega_4 \quad \omega_5 \quad \omega_6$ (a)  $\frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6}$ (b)  $1 \ 0 \ 0 \ 0 \ 0 \ 0$ (c)  $\frac{1}{8} \frac{2}{3} \frac{1}{3} \frac{1}{3} - \frac{1}{4} - \frac{1}{3}$ (d)  $\frac{1}{12} \frac{1}{12} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{3} \frac{3}{2}$ 

(e)  $0.6\ 0.6\ 0.6\ 0.6\ 0.6\ 0.6$ .

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10. One card is drawn from a well shuffled deck of 52 cards. If each

outcomes is equally likely, calculate the probability that the card

will be

(i) a diamond

(ii) not a ace

(iii) a black card (i.e., a club or, a spade) (iv) not a diamond

(v) not a black card.

**11.** A bag contains 9 discs of which 4 are red, 3 are blue and 2 are yellow. The disce are similar in shape and size. A disc is drawn at rendom from the bag. Calculate the probability that it will be (i) red, (ii) yellow, (iii) blue, (iv) not blue, (v) either red or blue.



**12.** Two students Anil and Ashima appeared is an examination. The probability that Anil will qualify the examination is 0.05 and that Ashima will qualify the examination is 0.10. The probability qualify the examination is 0.02. Find the probability that (a) Bothe Anil and Ashima will not qualify the examination.

(b) Atleast one of them will qualify the examination and (c) Only one of them will qualify the examination.





**13.** A committee of two persons is selected from two men and two women. What is the probability that the committee will have (a) no man? (b) one man? (c) two men?



**14.** On her vacations Veena visits four cities(A, B, C and D) in random order. What is the probability that she visits

(i) A before B? (ii) A before B and B before C?

(iii) A fist and B last? (iv) A either first or second? (v) A just before

Β?



**15.** Find the probability that when a hand of 7 cards is drawn from well sheffled deck of 52 cards, it contians (i) all kings (ii) 3 Kings (iii) atleast 3 Kings.



16. If A, B, C are three events associated with a random experiment,

prove that

 $P(A\cup B\cup C)=P(A)+P(B)+P(C)-P(A\cap B)-P(A\cap C)$ 

 $P(B\cap C)+P(A\cap B\cap C)$ 

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17. In a relay race there are five terms A, B, C, D and E.

(a) What is the probability that A, B and C finish first, second and

third, respectively.

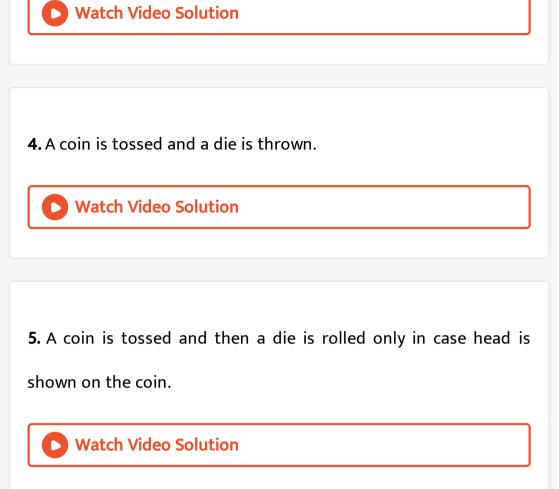
(ii) What is the probability that A, B and C are first three to finish

(In any order) (Assume that all finishing orders are equally likely).

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Exercise 16 1
<b>1.</b> A coin is tossed three times.
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<b>2.</b> A die is thrown two times.
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**3.** A coin is tossed four times.

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**6.** 2 boys and 2 girls are in Room X, and 1 boy and 3 girls are in Room Y. Specify the sample space for the experiment in which a room is selected and then a person.



7. One die of red colour, one of die white colour and one of blue colour are placed in a bag. One die is selected at random and rolled, its colour and the number on its uppermost face is noted. Describe the sample space.

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**8.** An experiment consists of recording boy-girl composition of families with 2 childern.

(i) What is the sample space if we are interested in knowing whether it is a boy or girl in the order of their births?

(ii) What is the sample space if we are interested in the number of

girls in the family?



**9.** A box contains 1 red and 3 identical white balls. Two balls are drawn at random in succession without replacement. Write the sample space for this experiment.

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**10.** An experiment consists of tossing a coin and then throwing it second time if a head occurs on the first toss, then a die is rolled once. Find the sample space.



11. Suppose 3 bulbs are selected at random from a lot. Each bulb is

tested and classified as defective(N). Write the sample space for

the experiment?

**12.** A coin is tossed. If the out come is a head, a die is thrown. If the die shows up an even number, the die is thrown again. What is the sample space for the experiment?

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**13.** The number 1, 2, 3 and 4 are written sepratly on four slips of paper. The slips are put in a box and mixed thoroughly. A person draws two slips from the box, one after the other, without replacement. Descrebe the sample space for the experiment?



**14.** An experiment consists of rolling a die and then tossing a coin if the number on the die is even. If the number on the die is odd,

the coin is tossed twice. Write the sample space for this experiment.

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**15.** A coin is tossed. If it shows tail, we draw a ball from a box contains of 2 red and 3 black balls. If it shows heads, we throw a die. Find the sample space of this experiment.

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16. A die is thrown repeatelly until a six comes up. What is thwe

sample space for this experiment?

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Exercise 16 2



**1.** A die is rolled. Let E be the event "die shows 4" and F be the event "die shows even number". Are E and F mutually exclusive?

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**2.** A die is thrown. Describe the following events:

(i) A: anumber less than? (ii) B: a number greater than 7

(iii) C: a multiple of 3 (iv) D: a number less than 4

(v) E: an even number greater than 4 (vi) F: a number not less than

3

Also

find

 $A\cup B, A\cap B, B\cup C, E\cap E, D\cap E, A-C, D-E, E\cap F', F'$ 

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3. An experiment involves rolling pair of dice and recording the numbers that come up. Describe the following events:
A: the sum is greater than 8, B: 2 occurs on either die
C: the sum is the least 7 and a mutually exclusive?
Which pairs of three events are mutually exclusive?



**4.** Three coins are tossed once. Let A denote the event 'three heads show", B denote the event "two heads and one tail show", C denote the event" three tails show and D denote the event 'a head shows on the first coin". Which events are

(i) mutually exclusive? (ii) simple (iii) Compound?



- 5. Three coins tossed. Describe.
- (i) Two events which are mutually exclusive.
- (ii) Three events which are mutully exclusive and exhaustive.
- (iii) Two events, which are not mutually exclusive.
- (iv) Two events which are mutually exclusive but not exhaustive.
- (v) Three event which are mutually exclusive but not exhaustive.



- 6. Three coins tossed. Describe.
- (i) Two events which are mutually exclusive.
- (ii) Three events which are mutully exclusive and exhaustive.
- (iii) Two events, which are not mutually exclusive.
- (iv) Two events which are mutually exclusive but not exhaustive.
- (v) Three event which are mutually exclusive but not exhaustive.

1. Which of the following can not be valid assignment of probabilities for outcomes of sample Space  $S = \{\omega_1, \omega_2, \omega_3, \omega_4, \omega_5, \omega_6, \omega_7\}$  Assignment  $\omega_1 \quad \omega_2 \quad \omega_3 \quad \omega_4 \quad \omega_5 \quad \omega_6$ (a) 0.1 0.01 0.05 0.03 0.01 0.2 0.6 (b)  $\frac{1}{7} \quad \frac{1}{7} \quad \frac{1}{7} \quad \frac{1}{7} \quad \frac{1}{7} \quad \frac{1}{7} \quad \frac{1}{7}$ (c) 0.1 0.2 0.3 0.4 0.5 - 0.6 - 0.7 (d) -0.1 0.2 0.3 0.4 - 0.2 0.1 0.3 (e)  $\frac{1}{14} \quad \frac{2}{14} \quad \frac{3}{14} \quad \frac{4}{14} \quad \frac{5}{14} \quad \frac{6}{14} \quad \frac{15}{14}$ 

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2. A coin is tossed twice, what is the probability that etleast on tail

occurs?



- **3.** A die I thrown, find the probability of following events:
- (i) A prime number will appear,
- (ii) A number les than or equal to 3 will appear,
- (iii) A number les than or equal to one will appear,
- (iv) A number more than 6 will appear,
- (v) A number les than 6 will appear.



**4.** A card is selected from a pack of 52 cards.

(a) How many points are there in the sample space?

(b) Calculate the probability that the card is an ace of spades.

(c) Calculate the probability that the card is (i) an ace (ii) black card.



**5.** 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 (i9ii) 12.



**6.** There are four men and six women on the city council. If one council member is selected for a committee at random, how likely

is it that it is a women?



**7.** 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 tosed once. Find the probability of getting.

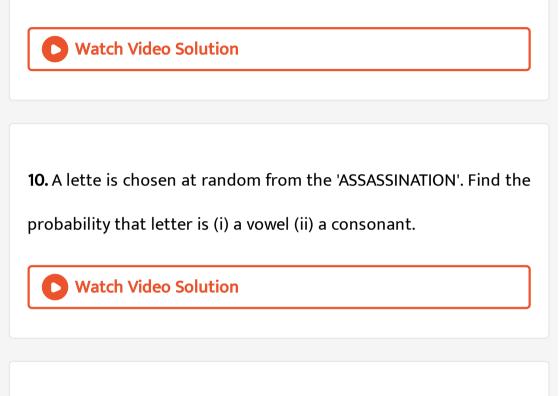


- 8. Three coin are tossed once. Find the probability of getting
- (i) 3 heads, (ii) 2 heads, (iii) atleast 2 heads,
- (iv) atmost 2 heads, (v) no heads, (vi) 3 tails,
- (vii) exactly two tail, (viii) no tail, (ix) atmost two tails.



**9.** If  $\frac{2}{11}$  Is the probability of an event, what is the probability of

the event 'not A'.



**11.** In a lottery, a porson chosen six different natural numbers at random from 1 to 20, and if these six number match with the six number already fixed by the lottery committee, be wins the prize. What is the probability of winning the prize in the game? [Hint order of the number is not important.]

**12.** Check whether the following probabilities P(A) and P(B) consistently defined

(i) 
$$P(A) = 0.5, P(B) = 0.7, P(A \cap B) = 0.6$$

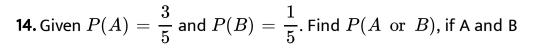
(ii)  $P(A) = 0.5, P(B) = 0.4, P(A \cup B) = 0.8$ 

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13. Fill up the blanks in following table:

 $P(A) \quad P(B) \quad P(A \cap B \quad P(A \cup B)$ (i)  $\frac{1}{3} \quad \frac{1}{5} \quad \frac{1}{15} \quad \dots$ (ii) 0.35 \ldots 0.25 \ldots 0.6
(iii) 0.5 \ldots 0.35 \ldots 0.7.

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are mutually excluive events.

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**15.** If E and F are events such that  $P(E) = \frac{1}{4}$ ,  $P(F) = \frac{1}{2}$  and P(E and F)  $= \frac{1}{8}$ , find (i) P(E or F), (ii) P(not E and not F).

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16. Events E and F are uch that P(not E or not F) = 0.25, State

whether E and F are mutually exclusive.



**17.** 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).

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**18.** In Class XI of a school 40% of the students study Mathematies and Biology. If a student is selected at random from the class, find the probability that he will be studying Mathemetics or Biology.



**19.** In an entrance test that is graded of the basis of two examination, 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?

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**20.** The probability that a student will pass the final examinatin in both English and Hindi is 0.5 and the probability of pasing neither is 0.1. If the probability of passing the English examination is 0.75. What is the probability of passing the Hindi examination?



**21.** 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 students has opted NSS but not NCC.

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Miscellaneous Exerciseon Chapter 16

1. A box contains 10 red marbles, 20 blue marbles and 30 green

marbles. 5 marbles are drawn from the box, what is the probability

that

(i) all will be blue? (ii) atleast one will be green?



1.4 cards are drawn from a well - shuffled deck of 52 cards. What is

the probability of obtaining 3 dimonds and one speak?

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Miscellaneous Exerciseon Chapter 18

**1.** A die has two faces each with number '1', three faces each number '2' and one face with number '3'. If die is rolled once, determine

(i) P(2), (ii) P(1 or 3), (iii) P(not 3).

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**1.** In a certains lottery 10,000 tickets are sold and ten equal prizes are awarded. What Is the probability of not getting a prize if you buy (a) one ticket (b) two tikets (c) 10 tickets.



### Miscellaneous Exerciseon Chapter 20

**1.** 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?

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**1.** Three letters are dictated to three person and an envolopes at random so that each envelope contains exactly one letter. Find the probability that at least one letter is in its proper envelope.

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Miscellaneous Exerciseon Chapter 22									
1.	А	and	В	are	two	events	such	that	
$P(A) = 0.54, P(B) = 0.69  { m and}  P(A \cap B) = 0.35$									
Find (i) $P(A \cup B$ (ii) $P(A^{\prime} \cap B^{\prime})$ (iii) $P(A \cap B^{\prime})$ (iv) $P(B \cap A^{\prime})$									
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**1.** From the employees of a company, 5 person are selected to repreent them in the managing committee of the company. Particular of five persons are as follows:

- S.No.Namesexage in years1.harishM302.RohonM333.sheetalF464.AlisF28
- 5. Salim M 41

A person is selected at random from this group to act as a spokespersons. What is the probability that the spokespersons will be either male or over 35 years?



#### Miscellaneous Exerciseon Chapter 24

**1.** If 4-digit numbers greater than 5,000 are randomly formed from the digits 0,1, 3, 5, and 7, what is the probability of forming a

number divided by 5 when,

(i) the digits are repeated? (ii) the repeition of digits is not allowed?



### Miscellaneous Exerciseon Chapter 25

**1.** The number lock of a suitcae has 4 wheels, each labelled with ten digits i.e., from 0 to 9. The lock opens with a sequence of four digits with no repeats. What is the probability of a person getting the right sequence to open the suitcase?

