

## Chapter 16

### Probability

For important terms and definitions refer NCERT text book.

#### **Type- I**

Concept : sample space

- (1) NCERT text book page 386 question no. 1 (\*)
- (2) NCERT text book page 386 question no. 2 (\*)
- (3) NCERT text book page 386 question no. 3 (\*)
- (4) NCERT text book page 386 question no. 4 (\*)
- (5) NCERT text book page 386 question no. 5 (\*)
- (6) NCERT text book page 386 question no. 11 (\*)
- (7) NCERT text book page 386 question no.12 (\*\*)

#### **Type- II**

Concept : types of events

- (1) NCERT text book page 393 question no. 2 (\*)
- (2) NCERT text book page 393 question no. 3 (\*)
- (3) NCERT text book page 393 question no. 1 (\*)
- (4) NCERT text book page 393 question no. 4 (\*\*)
- (5) NCERT text book page 392 example 7 (\*\*)

#### **Type- III**

Concept : Algebra of events:  $A \cup B$  ,  $A \cap B$  ,  $A$  but not  $B$  etc

- (1) NCERT text book page 393 question no. 6 (\*\*)

## EXTRA AND HOT QUESTIONS

- (1) From a group of 2 men and 3 women 2 persons are selected .  
Describe the sample space of the experiment. If E is the event in which 1 man and 1 woman are selected. Then which are the cases favourable to E (Type-I\*)
- (2) Two dice are rolled. A is the event that the sum of the numbers shown on the two dice is 5. B is the event that at least one of the dice shows up a 3. Are the two events A and B.  
(a) Mutually exclusive.  
(b) Exhaustive (Type-II\*\*)
- (3) Two dice are thrown the events A , B, C are as follows  
A: Getting an odd number on the first die.  
B: Getting a total of 7 on the two dice.  
C: Getting a total of greater than or equal to 8 on the two dice.  
Describe the following events  
(a)  $A \cup B$   
(b)  $A'$   
(c)  $B - C$   
(d)  $B \cap C$

## PROBABILITY OF AN EVENT

### Important concepts

$$P(E) = \frac{\text{no of outcomes favourable to } E}{\text{total no of outcomes}}$$

If A and B are two mutually exclusive events  $P(A \cup B) = P(A) + P(B)$

If A and B are any two events then  $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$$P(\text{not } A) = 1 - P(A)$$

## Type – I

Concept: Probability of an event

- (1) N.C.E.R.T text book page 404 question no.3(\*)
- (2) N.C.E.R.T text book page 404 question no.4(\*\*)
- (3) N.C.E.R.T text book page 404 question no.8(\*\*)
- (4) N.C.E.R.T text book page 404 question no.10(\*\*)
- (5) N.C.E.R.T text book page 403 example 14(\*\*)
- (6) N.C.E.R.T text book page 400 example 10(\*\*)

## EXTRA AND HOT QUESTIONS

- (7) Three identical dice are rolled . Find the probability that the same number will appear on each of them.  
Ans:  $\frac{1}{36}$  (hot)
- (8) Two dice are thrown simultaneously . Find the probability of getting a total of 9.  
Ans:  $\frac{1}{9}$  (\*)
- (9) A bag contains 8 red ,3 white and 9 blue balls. Three balls are drawn at random from the bag. Determine the probability that none of the balls drawn is white .  
Ans:  $\frac{34}{57}$  (\*\*)
- (10) In a single throw of 3 dice. Find the probability of not getting the same number on all the dice.  
Ans:  $\frac{35}{36}$  (\*\*)
- (11) The letters of the word “SOCIETY “ are placed at random in a row .What is the probability that the 3 vowels come together.  
Ans:  $\frac{1}{7}$  (\*\*)
- (12) Find the probability that in an arrangement of the letters of the word “DAUGHTER” the letter D occupies the first place.  
Ans:  $\frac{1}{8}$  (\*\*)
- (13) Find the probability that in a random arrangement of the letters of the word “INSTITUTION’ the three T’s are together.  
Ans: P  $\frac{1}{110}$  (\*\*)

## Type – II

$P(A \cup B) = P(A) + P(B)$  (mutually exclusive cases)

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

- (1) N.C.E.R.T page 405 question no.14(\*\*)
- (2) N.C.E.R.T page 405 question no.15(\*)
- (3) N.C.E.R.T page 405 question no.16(\*\*)
- (4) N.C.E.R.T page 405 question no.17(\*\*)
- (5) N.C.E.R.T page 405 question no.18(\*\*)
- (6) N.C.E.R.T page 405 question no.19(\*\*)
- (7) N.C.E.R.T page 405 question no.20 (\*\*)
- (8) N.C.E.R.T page 409 misc exercise question no.3 (\*\*)
- (9) N.C.E.R.T page 401 example 11(\*\*)

## EXTRA AND HOT QUESTIONS

- (1) One card is drawn from a set of 17 cards numbered 1 to 17. Find the probability that the number is divisible by 3 or 7.  
Ans:  $\frac{7}{17}$ . (\*)
- (2) Two dice are thrown together. What is the probability that the sum of the numbers of the two faces is neither 9 nor 11.  
Ans:  $\frac{5}{16}$  (\*)
- (3) Two unbiased dice are thrown. Find the probability that neither a doublet nor a total of 10 will appear.  
Ans:  $\frac{7}{9}$  (\*\*)
- (4) Two cards are drawn from a well shuffled pack of 52 cards without replacement. Find the probability that neither a jack nor a card of spade is drawn.  
Ans:  $\frac{105}{221}$  (\*\*)
- (5) If  $P(A \cup B) = 0.6$  and  $P(A \cap B) = 0.2$ . Find  $P(\bar{A}) + P(\bar{B})$   
Ans: 1.2

(6) A and B are two mutually exclusive events if  $P(A) = 0.5$  and  $P(\bar{B}) = 0.6$ . Find  $P(A \cup B)$

### Type – III

At least one, at most one cases

- (1) N.C.E.R.T page 402 examples 12 (\*\*) {hot}
- (2) N.C.E.R.T page 407 example 15 (\*\*)
- (3) N.C.E.R.T page 408 misc exercise question .1 (\*\*) {hot}
- (4) N.C.E.R.T page 408 misc exercise question.2 (\*\*)
- (5) N.C.E.R.T page 409 misc exercise question 7 (\*\*)
- (6) N.C.E.R.T page 409 misc exercise question 9 (\*\*)

### EXTRA AND HOT QUESTIONS

(1) Three coins are tossed once . Find the probability of getting

- (a) Atmost 2 heads
- (b) Atleast 2 heads
- (c) Exactly 2 tails
- (d) Atmost 2 tails
- (e) 3 heads
- (f) No heads

Ans: (a)  $\frac{7}{8}$  (b)  $\frac{1}{2}$  (c)  $\frac{3}{8}$  (d)  $\frac{7}{8}$  (e)  $\frac{1}{8}$  (f)  $\frac{1}{8}$

(2) The probability that a student will get A,B,C or D grade are

0.4,0.35,0.15and 0.1 respectively. Find the probability that she will get

- (a) B or C grade
- (b) Atmost C grade

(3) In a single throw of 2 dice write the corresponding events and the probability of getting

- (a) A total of 9
- (b) Two ones
- (c) Atleast one 6
- (d) A sum of 9 or 11
- (e) A sum of atleast 10
- (f) A sum as a prime number

Ans: (a)  $\frac{1}{9}$  (b)  $\frac{1}{36}$  (c)  $\frac{11}{36}$  (d)  $\frac{1}{6}$  (e)  $\frac{1}{6}$  (f)  $\frac{5}{12}$