# Exam Preparation 1

**Exam : ICSE** **Sub. : Maths 10th** **Topic : Probability**

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$$P(A) = \frac{\text{Number of outcomes favourable to A}}{\text{Numbers of possible outcomes of the experiment}}$$

| Practical Application | |
|---|---|
| Tossing of unbiased coin | ❖ Two outcomes: Head (H) and Tail (T) |
| Tossing of 2 unbiased coin simultaneously | ❖ Four outcomes: HH,HT,TH,TT |
| Tossing of 3 unbiased coin simultaneously | ❖ Eight outcomes: HHH,HHT,HTH,HTT,THH,THT,TTH,TTT |
| Throwing of unbiased die | ❖ 6 outcomes: numbers 1,2,3,4,5 and 6 |
| Throwing of 2unbiased dice simultaneously. | ❖ 36 outcomes: (1,1),(1,2),…….(6,5),(6,6) |
| Shuffling of a deck of cards | ❖ A "standard" deck of playing cards consists of 52 Cards in each of the 4 suits of Spades, Hearts, Diamonds, and Clubs<br>❖ Cards of Spades and clubs are black cards.<br>❖ Cards of hearts and diamonds are red cards.<br>❖ Each suit contains 13 cards: Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, King.<br>❖ King, Queen and Jack (or Knaves) are face cards. |

The **sum of the probabilities** of all the elementary events of an experiment is 1.

The event $\bar{A}$ representing 'not A', is called the complement of the event A. We also say that $\bar{A}$ and A are complementary events.

Bounds of P(E) :$0 \leq P(E) \leq 1$; **Probability can never be negative**.

| Nature of the events | Probability |
|---|---|
| Sure or certain events | One |
| Impossible events | Zero |

1. Cards bearing numbers 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20 are kept in a bag. A card is drawn at random from this bag. Find a probability of getting a card which is: (i) a prime number (ii) a number divisible by 4 (iii) a number that is multiple of 6 (iv) an odd number **(ICSE 2018)**
2. Sixteen cards are labeled as a,b,c, ..., m,n,o,p . They are put in a box and shuffled. A boy is asked to draw a card from the box. What is the probability that the card draw is: (i) A Vowel (ii) A Consonant (iii) None of the letters of the word median. **(ICSE 2017)**
3. A game of number has cards marked with 11, 12, 13,…..39,40. A card is drawn at random. Find the probability that the number on the card drawn is: i) A perfect square ii) Divisible by 7. **(ICSE 2016)**
4. A bag contain 5 white balls, 6 red balls and 9 green balls. A ball is drawn at random from the bag, Find the probability that the ball drawn is: (i) a green ball (ii) a white or a red ball (iii) is neither a green ball nor a white ball. **(ICSE 2015)**
5. A die has 6 faces marked by the given numbers as shown below: 1, 2, 3, -1, -2, -3 . The die is thrown once. What is the probability of getting? (i) A positive integer (ii) An integer greater than -3 (iii) The smallest integer **(ICSE 2014)**
6. A box contain some black balls and 30 white balls. If the probability of drawing a black ball is two-fifths of a white ball, find the number of black balls in the box. **(ICSE 2013)**
7. Two coins are tossed once; Find the probability of getting: (i) 2 heads (ii) At least 1 tail **(ICSE 2012)**
8. From a pack of 52 playing cards all cards whose numbers are multiples of 3 are removed. A card is now drawn at random. What is the probability that the card drawn is; (i) a face card (ii) an even number red card. **(ICSE 2011)**

**Question**: Three coins are tossed. What is the probability of getting at most two tails?

**Solution:** Total number of outcomes possible when a coin is tossed = 2 (∵ Head or Tail)

Hence, total number of outcomes possible when 3 coins are tossed, $n(S) = 2 \times 2 \times 2 = 8$

(∵ i.e., S = {TTT, TTH, THT, HTT, THH, HTH, HHT, HHH})

E = event of getting at most two Tails = {TTH, THT, HTT, THH, HTH, HHT, HHH}

Hence, $n(E) = 7$ $P(E) = \frac{n(E)}{n(S)} = \frac{7}{8}$

**Question:** A card is drawn from a well shuffled pack of 52 cards. Find the probability of: non-face card of black colour.

**Solution:** Cards of spades and clubs are black cards. Number of spades = 13 and Number of clubs = 13 Therefore, total number of black card out of 52 cards = 13 + 13 = 26

Number of face cards in each suits namely spades and clubs = 3 + 3 = 6 Therefore, total number of non-face card of black colour out of 52 cards = 26 - 6 = 20. Therefore, probability of getting 'non-face card of black colour'. $P(J) = \frac{n(E)}{n(S)} = \frac{20}{52} = \frac{5}{13}$