## Some important remarks about Coins, Dice, Playing cards and Envelopes.

(1) Coins:A coin has a head side and a tail side. If an experiment consists of more than a coin, then coins are considered to be distinct if not otherwise stated.
Number of exhaustive cases of tossing $n$ coins simultaneously (or of tossing a coin $n$ times) $=2^{n}$.
(2) Dice:A die (cubical) has six faces marked $1,2,3,4,5,6$. We may have tetrahedral (having four faces $1,2,3,4$ ) or pentagonal (having five faces $1,2,3,4,5$ ) die. As in the case of coins, if we have more than one die, then all dice are considered to be distinct if not otherwise stated. Number of exhaustive cases of throwing n dice simultaneously (or throwing one dice n times) $=$ 6 .
(3) Playing cards:A pack of playing cards usually has 52 cards. There are 4 suits (Spade, Heart, Diamond and Club) each having 13 cards. There are two colours red (Heart and Diamond) and black (Spade and Club) each having 26 cards.

In thirteen cards of each suit, there are 3 face cards or coart cards namely king, queen and jack. So there are in all 12 face cards ( 4 kings, 4 queens and 4 jacks). Also there are 16 honour cards, 4 of each suit namely ace, king, queen and jack.
(4) Probability regarding $\mathbf{n}$ letters and their envelopes:If $\boldsymbol{n}$ letters corresponding to n envelopes are placed in the envelopes at random, then
(i) Probability that all letters are in right envelopes $=\frac{1}{n!}$.
(ii) Probability that all letters are not in right envelopes $=1-\frac{1}{n!}$.
(iii) Probability that no letter is in right envelopes $=\frac{1}{2!}-\frac{1}{3!}+\frac{1}{4!}-\ldots+(-1)^{n} \frac{1}{n!}$.
(iv) Probability that exactly $r$ letters are in right envelopes $=\frac{1}{r!}\left[\frac{1}{2!}-\frac{1}{3!}+\frac{1}{4!}-\ldots . .+(-1)^{n-r} \frac{1}{(n-r)!}\right]$.

