5. Find the probability of getting a sum 2, Sum 3, Sum 4, --- Sum 12 if two dice are thrown.

Solution :-

Sample space
$$= \{ (1,1) (1,2) (1,3) (1,4) (1,5) (1,6)$$
$$(2,1) (2,2) (2,3) (2,4) (2,5) (2,6)$$
$$(3,1) (3,2) (3,3) (3,4) (3,5) (3,6)$$
$$(4,1) (4,2) (4,3) (4,4) (4,5) (4,6)$$
$$(5,1) (5,2) (5,3) (5,4) (5,5) (5,6)$$
$$(6,1) (6,2) (6,3) (6,4) (6,5) (6,6) \}$$

then $n(S) = 36$

Let A_1 be the event of getting sum 2

$$A_1 = \{ (1,1) \}$$

$$n(A_1) = 1$$

$$\therefore P(\text{sum 2}) = \frac{n(A_1)}{n(S)} = \frac{1}{36}$$

Let A_2 be the event of getting sum 3

$$A_2 = \{(1,2)\ (2,1)\}$$

$$n(A_2) = 2$$

$$\therefore P(\text{sum } 3) = \frac{n(A_2)}{n(s)} = \frac{2}{36}$$

Let A_3 be the event of getting sum 4

$$A_3 = \{(1,3)\ (3,1)\ (2,2)\}$$

$$n(A_3) = 3$$

$$\therefore P(\text{sum } 4) = \frac{n(A_3)}{n(s)} = \frac{3}{36}$$

Let A_4 be the event of getting sum 5

$$A_4 = \{(1,4)\ (4,1)\ (2,3)\ (3,2)\}$$

$$n(A_4) = 4$$

$$\therefore P(\text{sum } 5) = \frac{n(A_4)}{n(s)} = \frac{4}{36}$$

Let A_5 be the event of getting sum 6

$$A_5 = \{(1,5)(5,1)(2,4)(4,2)(3,3)\}$$

$$n(A_5) = 5$$

$$\therefore P(sum\ 6) = \frac{5}{36}$$

Let A_6 be the event of getting sum 7

$$A_6 = \{(1,6)(6,1)(2,5)(5,2)(3,4)(4,3)\}$$

$$n(A_6) = 6$$

$$\therefore P(sum\ 7) = \frac{6}{36}$$

Let A_7 be the event of getting sum 8

$$A_7 = \{(2,6)(6,2)(3,5)(5,3)(4,4)\}$$

$$n(A_7) = 5$$

$$P(sum\ 8) = \frac{5}{36}$$

$$\text{by } P(sum\ 9) = \frac{4}{36}$$

$$P(sum\ 10) = \frac{3}{36}$$

$$P(sum\ 11) = \frac{2}{36}$$

$$P(sum\ 12) = \frac{1}{36}$$

$$= \times =$$

6. A uniform die is thrown at random. Find the probability that the number on it is (i) even

(ii) odd

(iii) even or multiple of 3

(iv) even and multiple of 3

(v) greater than 4

Solution :-

Sample Space = { 1, 2, 3, 4, 5, 6 }

$$n(s) = 6.$$

(i) Let A be the event that the number on it is even

$$A = \{ 2, 4, 6 \}$$

$$n(A) = 3$$

$$\therefore \ P(\text{even}) = \frac{3}{6} = \frac{1}{2}$$

ii) Let B be the event that the number
on it is odd

$$B = \{1, 3, 5\}$$

$$n(B) = 3$$

$$\therefore P(\text{odd}) = \frac{3}{6} = \frac{1}{2}$$

iii) Let C be the event that the
number on it is even or multiple
of 3

$$C = \{2, 3, 4, 6\}$$

$$n(C) = 4$$

$$\therefore P(\text{even or multiple of 3}) = \frac{4}{6} = \frac{2}{3}$$

iv) Let D be the event that the number
on it is even and multiple of 3

$$D = \{6\}$$

$$\therefore P(\text{even and multiple of 3}) = \frac{1}{6}$$

(v) Let E be the event that the number
on it is greater than 4

$$E = \{5, 6\}$$

$$n(E) = 2$$

$$\therefore P(\text{greater than 4}) = \frac{2}{6} = \frac{1}{3}$$

$$= x =$$