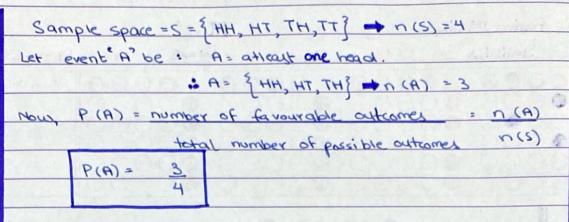# LGS GROUP OF COLLEGES
A PROJECT OF LAHORE GRAMMAR SCHOOL

Name: Fatima Malik   Class: XI-B   Roll No.

Subject: Statistics   Test No. WK-5   Date: 18-11-24

	A B C D		A B C D		A B C D		A B C D	Marks Obtained
1	● ○ ○ ○	6	○ ○ ○ ○	11	○ ○ ○ ○	16	○ ○ ○ ○	
2	○ ○ ● ○	7	○ ○ ○ ○	12	○ ○ ○ ○	17	○ ○ ○ ○	
3	● ○ ○ ○	8	○ ○ ○ ○	13	○ ○ ○ ○	18	○ ○ ○ ○	
4	○ ○ ○ ○	9	○ ○ ○ ○	14	○ ○ ○ ○	19	○ ○ ○ ○	
5	○ ○ ○ ○	10	○ ○ ○ ○	15	○ ○ ○ ○	20	○ ○ ○ ○	

SHORT QUESTIONS :-

Q2 (i)

Set :

" A set is a collection of well-defined distinct objects."

=> The objects which make up a particular set, are called elements or members of the set.

=> The set are usually denoted by capital letters as A, B, C etc. and the elements of set are generally denoted by small letters.

* **For example:** Set of vowels is $V = \{a, e, i, o, u\}$

(ii)

Q2   Solve $\dfrac{12!}{10!}$

OR   * **Method II :-**

Method I:

$= \dfrac{12 \times 11 \times 10!}{10!}$

$= \dfrac{12 \times 11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}$

$= 12 \times 11$

$= \dfrac{479001600}{3628800}$

$= \boxed{132}$ Ans

$= \boxed{132}$ Ans

(iii)

Sample space $= S = \{HH, HT, TH, TT\} \implies n(S) = 4$

Let event 'A' be :   A = atleast one head.

$\therefore A = \{HH, HT, TH\} \implies n(A) = 3$

Now, $P(A) = \dfrac{\text{number of favourable outcomes}}{\text{total number of possible outcomes}} = \dfrac{n(A)}{n(S)}$

$$\boxed{P(A) = \dfrac{3}{4}}$$

(iv)

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

Let 'A' be an event such that A = even number appears

$\therefore A = \{2, 4, 6\} \implies n(A) = 3$

Now, $P(A) = \dfrac{n(A)}{n(S)}$

$P(A) = \dfrac{\cancel{3}^{\,1}}{\cancel{6}_{\,2}}$

$$\boxed{P(A) = \dfrac{1}{2} \quad \text{or} \quad 0.5}$$

LONG QUESTION :-

❦(Q3)❦

Sample space when two dices are thrown:-

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

But according to the given condition, the elements which have both same numbers are excluded.

Therefore, we will have new sample space.

$$S = \{(1,2)\ (1,3)\ (1,4)\ (1,5)\ (1,6)$$
$$(2,1)\ (2,3)\ (2,4)\ (2,5)\ (2,6)$$
$$(3,1)\ (3,2)\ (3,4)\ (3,5)\ (3,6) \quad \longrightarrow n(s) = 30$$
$$(4,1)\ (4,2)\ (4,3)\ (4,5)\ (4,6)$$
$$(5,1)\ (5,2)\ (5,3)\ (5,4)\ (5,6)$$
$$(6,1)\ (6,2)\ (6,3)\ (6,4)\ (6,5)\}$$

(i) **Probability that sum is 6:**

Let event 'A' be : A = sum of numbers is 6

$$\therefore A = \{(1,5)\ (2,4)\ (4,2)\ (5,1)\} \longrightarrow n(A) = 4$$

Now, $P(A) = \dfrac{\text{number of favourable outcomes}}{\text{total number of possible outcomes}} = \dfrac{n(A)}{n(S)}$

$$P(A) = \frac{4}{30} \qquad \Longrightarrow \qquad \boxed{P(A) = \frac{2}{15}}$$

(ii) **Probability that the sum is 4 or less:**

Let 'B' be an event such that A = sum of numbers is 4 or less

$$\therefore B = \{(1,2)\ (1,3)\ (2,1)\ (3,1)\} \longrightarrow n(B) = 4$$

Now, $P(B) = \dfrac{n(B)}{n(S)}$

$$P(B) = \frac{4}{30} \qquad \Longrightarrow \qquad \boxed{P(B) = \frac{2}{15}}$$

(iii) **Probability that sum is even:**

Let 'C' be an event such that C = sum of numbers is even

$$\therefore C = \{(1,3)(1,5)(2,4)(2,6)(3,1)(3,5)(4,2)(4,6)$$
$$(5,1)(5,3)(6,2)(6,4)\} \longrightarrow n(C) = 12$$

Now, $P(C) = \dfrac{n(C)}{n(S)}$

$$P(C) = \frac{12}{30} \qquad \Longrightarrow \qquad \boxed{P(C) = \frac{2}{5}}$$