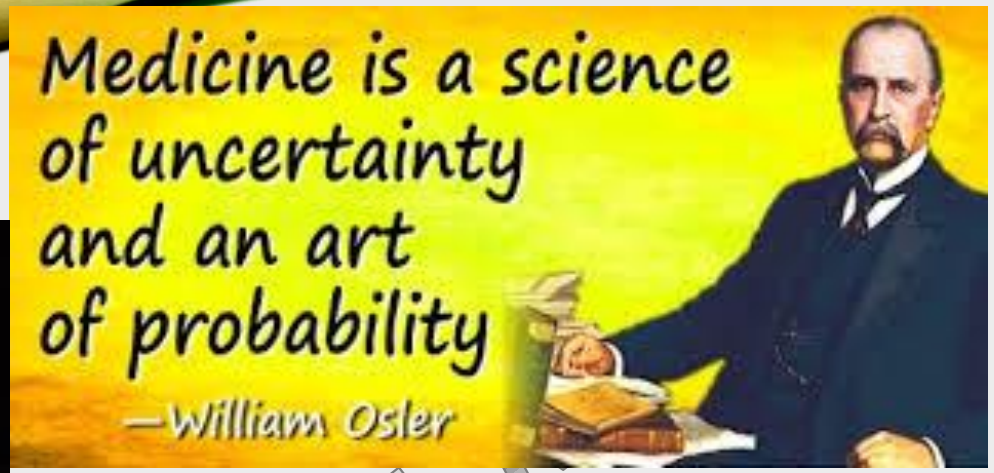
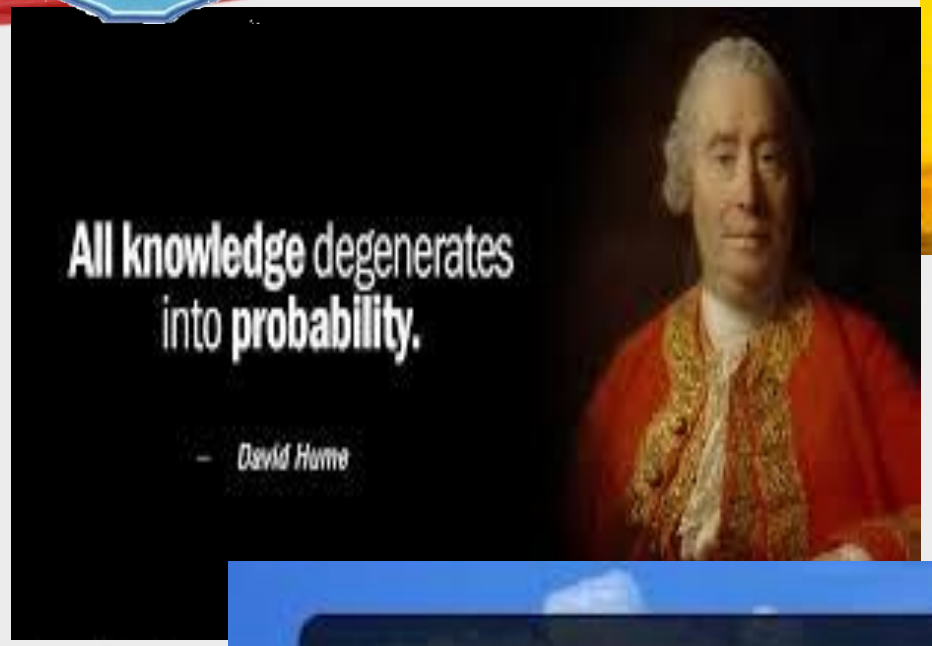
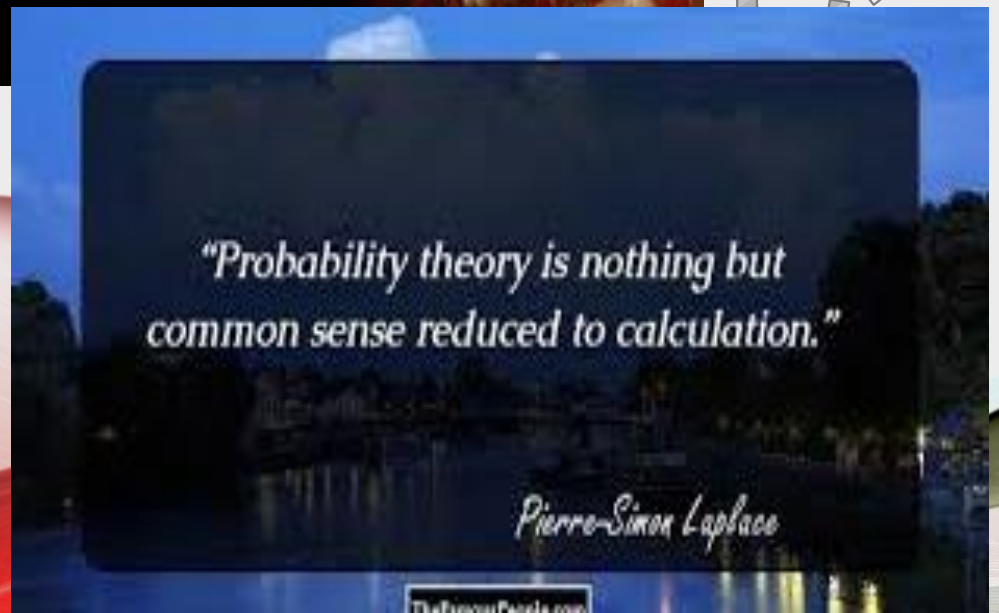






PROBABILITY

CLASS 11
MODULE 9

MCQ

TRY

Question1) If the probability for 'A' to fail in an examination is 0.2 and that for 'B' is 0.3, then what is the probability for the failure of either 'A' or 'B'?

(A) > 0.5 **(B)** 0.5 **(C)** ≤ 0.5 **(D)** 0

Solution: P(A fails)= P(X) = 0.2

P(B fails)= P(Y) = 0.3

P(either A or B fails) = P(X U Y)

$= P(X) + P(Y) - P(X \cap Y)$

$= 0.2 + 0.3 - P(X \cap Y)$

≤ 0.5

Ans: (c)

MCQ

TRY

Question 2) Two numbers are selected randomly from the set $S=\{1,2,3,4,5,6\}$ without replacement one-by-one. The probability that minimum of the two numbers is less than 4 is

A. $\frac{1}{15}$ B. $\frac{14}{15}$ C. $\frac{1}{5}$ D. $\frac{4}{5}$

Solution: Total ways $2! \, {}^6C_2 = 30$.

Favourable cases = 30 − 6 = 24.

Probability = $\frac{24}{30} = \frac{4}{5}$

Ans: (d)

MCQ

TRY

Question 3) Three numbers are chosen from 1 to 20. Find the probability that they are not consecutive

(A) $\frac{186}{190}$ (B) $\frac{187}{190}$ (C) $\frac{188}{190}$ (D) $\frac{18}{{}^{20}C_3}$

Solution:

number of ways that they are consecutive = (1,2,3),(2,3,4),(3,4,5)..... (18,19,20) = **18**

P (they are not consecutive) = 1- P (they are consecutive)

$$= 1 - \frac{18}{{}^{20}C_3}$$

$$= 1 - \frac{3}{190}$$

$$= \frac{187}{190}$$

Ans: (b)

Mis. Ex

5) Out of 100 students, two sections of 40 and 60 are formed. If you and your friend are among the 100 students, what is the probability that (a) You both enter the same sections? (b) You both enter the different sections?

(a) you both enter the same sections?

Solution:

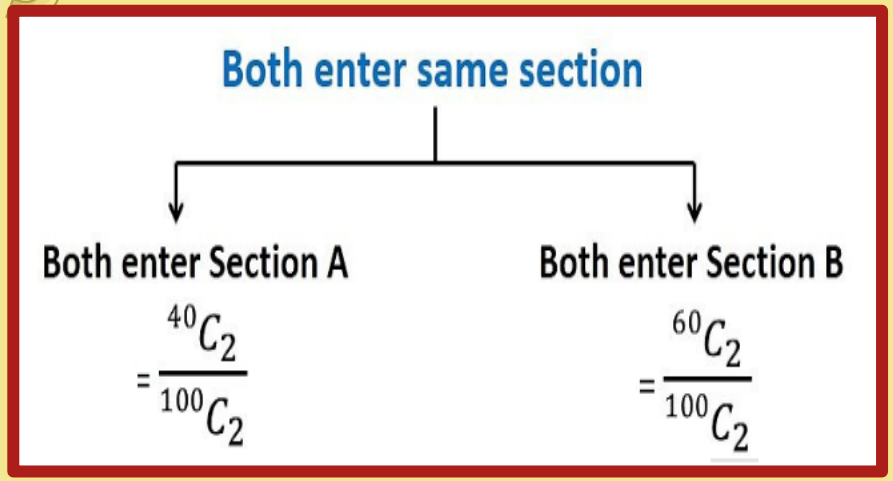
Probability that two students enter same section

$$= P(A) + P(B)$$

$$= \frac{{}^{40}C_2}{{}^{100}C_2} + \frac{{}^{60}C_2}{{}^{100}C_2}$$

$$= \frac{\left(\frac{40!}{2!\,38!}\right)}{\left(\frac{100!}{2!\,98!}\right)} + \frac{\left(\frac{60!}{2!\,58!}\right)}{\left(\frac{100!}{2!\,98!}\right)}$$

$$= \frac{40 \times 39}{100 \times 99} + \frac{60 \times 59}{100 \times 99} = \frac{17}{33}$$



TRY

(b) you both enter the different sections?

Ans: $= \frac{16}{33}$

Mis.Ex.

6) Three letters are dictated to three persons and an envelope is addressed to each of them, the letters are inserted into the envelopes at random so that each employee contains exactly one letter. Find the probability that at least one letter is in its proper envelope.

Solution: Let envelope be denoted by A, B, C and letters by a, b, c

Possible combinations can be

Aa Bb Cc , Ab Ba Cc , Ac Bb Ca ,

Aa Bc Cb , Ab Bc Ca , Ac Ba Cb .

$$P(\text{at least one letter is in its proper envelope}) = \frac{4}{6}$$

$$= \frac{2}{3}$$

EXTRA SUM

1)A bag contains 30 tickets numbered 1 to 30. Five tickets are drawn at random and arranged in ascending order. Find the probability that the middle number is 20.

$$\therefore \text{Required probability} = \frac{{}^{19}C_2 \times {}^{10}C_2}{{}^{30}C_5}$$

NOTE

a	b	20	c	d

a, b lie within 1-19

C, d lie within 21-30

SIMPLIFY YOUR OWN

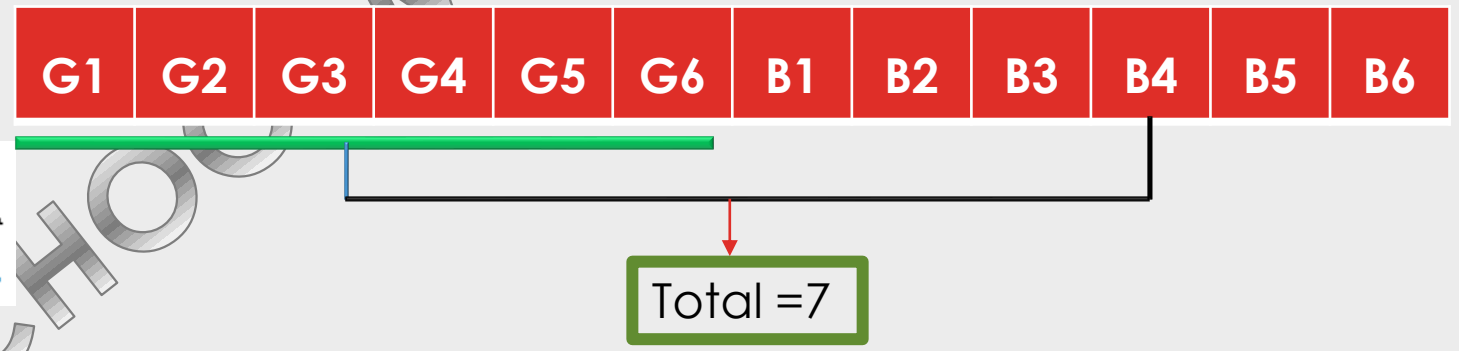
$$= \frac{285}{5278}$$

EXTRA SUM

2) Six boys and six girls sit in a row at random. Find the probability that (i) the six girls sit together. (ii) the boys and girls sit alternately.

The total number of arrangements of six boys and six girls = 12!

(i) the six girls sit together.



$$\therefore \text{Required probability} = \frac{7! \times 6!}{(12)!} = \frac{1}{132}$$

(ii) the boys and girls sit alternately.

$$\therefore \text{Required probability} = \frac{2 \times 6! \times 6!}{(12)!}$$

$$= \frac{1}{462}$$

ASSIGNMENTS

1) The probability that at least one of the events A and B occurs is 0.6. If A and B occur simultaneously with probability 0.2, then $P(\overline{A}) + P(\overline{B})$ is

(A) 0.4 (B) 0.8 (C) 1.2 (D) 1.6

2) A committee of two persons is selected from two men and two women. What is the probability that the committee will have (a) no man? (b) one man? (c) two men?

3) 3) Find the probability that when a hand of 7 cards is drawn from a well shuffled deck of 52 cards, it contains (i) all Kings (ii) 3 Kings (iii) atleast 3 Kings.

Thank You and Happy Learning