

PROBABILITY

**CLASS 11
MODULE 8**

Question 1) The letters of the word 'SOCIETY' are placed at random in a row. What is the probability that three vowels come together

- a) $\frac{2}{7}$ b) $\frac{3}{7}$ c) $\frac{5}{7}$ d) $\frac{1}{7}$.

Ans: (d)



MCQ

Question 2: 4 cards are drawn from a well-shuffled deck of 52 cards. What is the probability of obtaining 3 diamonds and one spade?

TRY

a) $\frac{{}^{13}C_3 \times {}^{13}C_1}{{}^{52}C_5}$

b) $\frac{{}^{13}C_3 \times {}^{13}C_1}{{}^{52}C_4}$

c) $\frac{{}^{13}C_2 \times {}^{13}C_1}{{}^{52}C_5}$

d) $\frac{{}^{13}C_3 \times {}^{13}C_2}{{}^{52}C_5}$

INDIAN

Ans: (b)



MCQ

TRY

Question 3: What is the probability of a leap year having 53 Tuesdays or 53 Wednesdays?

a) $\frac{3}{7}$

b) $\frac{1}{7}$

c) $\frac{4}{7}$

d) $\frac{2}{7}$

Ans: (a)



21. In a class of 60 students, 30 opted for NCC, 32 opted for NSS and 24 opted for both NCC and NSS. If one of these students is selected at random, find the probability that:

- (i) The student opted for NCC or NSS
- (ii) The student has opted neither NCC nor NSS
- (iii) The student has opted NSS but not NCC

Ex 16.3

Ans. Given: Total number of students $n(S) = 60$

Let A be the event that student opted for NCC and B be the event that the student opted for NSS.

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$= \frac{30}{60} + \frac{32}{60} - \frac{24}{60}$$

$$= \frac{19}{30}$$

$$n(A) = 30, n(B) = 32 \text{ and } n(A \cap B) = 24$$



TRY

(ii) The student has opted neither NCC nor NSS

Ex 16.3

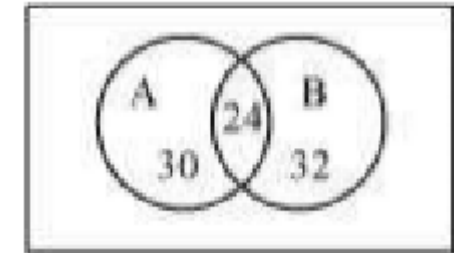


$$\begin{aligned} P(\text{Student has opted neither NCC nor NSS}) &= P(\bar{A} \cap \bar{B}) \\ &= P(\overline{A \cap B}) \\ &= 1 - P(A \cup B) \\ &= 1 - \frac{19}{30} \\ &= \frac{11}{30} \end{aligned}$$

(iii) The student has opted NSS but not NCC

The given information can be represented by a Venn diagram as

$$\begin{aligned} \text{Number of students who have opted for NSS but not NCC} &= n(B - A) \\ &= n(B) - n(A \cap B) \\ &= 32 - 24 \\ &= 8 \end{aligned}$$



Thus, the probability that the selected student

$$\text{has opted for NSS but not for NCC} = \frac{8}{60} = \frac{2}{15}$$

MISCELLANEOUS EXERCISE

Question 1: A box contains 10 red marbles, 20 blue marbles and 30 green marbles. 5 marbles are drawn from the box, what is the probability that (i) all will be blue? (ii) at least one will be green?

(i) \therefore Probability that all marbles will be blue = $\frac{{}^{20}C_5}{{}^{60}C_5}$

(ii) \therefore Probability that no marble is green = $\frac{{}^{30}C_5}{{}^{60}C_5}$

\therefore Probability that at least one marble is green = $1 - \frac{{}^{30}C_5}{{}^{60}C_5}$



MISCELLANEOUS EXERCISE



Question 4: In a certain lottery, 10,000 tickets are sold and ten equal prizes are awarded. What is the probability of not getting a prize if you buy (a) one ticket (b) two tickets? (c) 10 tickets?

Total number of tickets sold = 10,000

Number of prizes awarded = 10

(a) If we buy one ticket, then

$$P(\text{getting a prize}) = \frac{10}{10000} = \frac{1}{1000}$$

$$\therefore P(\text{not getting a prize}) = 1 - \frac{1}{1000} = \frac{999}{1000}$$

$$\text{OR } \frac{{}^{9990}C_1}{{}^{10000}C_1} = \frac{9990}{10000}$$

(b) If we buy two tickets, then

Number of tickets not awarded = $10,000 - 10 = 9990$

$$P(\text{not getting a prize}) = \frac{{}^{9990}C_2}{{}^{10000}C_2}$$

(c) If we buy 10 tickets, then

$$P(\text{not getting a prize}) = \frac{{}^{9990}C_{10}}{{}^{10000}C_{10}}$$

ASSIGMENTS

- 1) While shuffling a pack of 52 cards. 2 cards are accidentally dropped. Find the probability that missing cards are of different colours.
- 2) A five digit number is formed at random by using the digits 1,2,3,4,5,6 and 7. Find the chance the number formed has none of its digits repeated.
- 3) Two students Anil and Ashima appeared in an examination. The probability that Anil will qualify the examination is 0.05 and that Ashima will qualify the examination is 0.10. The probability that both will qualify the examination is 0.02. Find the probability that
 - (a) Both Anil and Ashima will not qualify the examination.
 - (b) Atleast one of them will not qualify the examination and
 - (c) Only one of them will qualify the examination.

Answers : 1) $\frac{26}{51}$ 2) $\frac{360}{2401}$ 3) a) 0.87 b) 0.98 c) 0.11



Thank You and Happy Learning

