10.3.3.3.5

EE24BTECH11036 - Krishna Patil

Question: 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 the student has opted neither NCC nor NSS.

Solution:

Given:

Symbol	Description
$N = 60$	Total number of students
$\|A\| = 30$	Students who opted for NCC
$\|B\| = 32$	Students who opted for NSS
$\|A \cap B\| = 24$	Students who opted for both NCC and NSS

TABLE 0: Details of students in the class

We aim to find the probability of a student opting for neither NCC nor NSS, i.e., the complement of $A \cup B$, denoted as $|(A \cup B)^c|$.

1) **Calculate $|A \cup B|$:**

$$\begin{aligned} |A \cup B| &= |A| + |B| - |A \cap B| \\ &= 30 + 32 - 24 \\ &= 38 \end{aligned}$$

2) **Find $|(A \cup B)^c|$:**

$$\begin{aligned} |(A \cup B)^c| &= N - |A \cup B| \\ &= 60 - 38 \\ &= 22 \end{aligned}$$

3) **Calculate the probability:**

$$\begin{aligned} P(\text{neither}) &= \frac{|(A \cup B)^c|}{N} \\ &= \frac{22}{60} \\ &= \frac{11}{30} \end{aligned}$$

Final Answer: The probability that the student has opted for neither NCC nor NSS is $\frac{11}{30}$.

After solving this computationally, we get simulated Probability of neither NCC nor NSS: 0.36624 .