CS & IT ENGINEERING

SATISH YADAV SIR

Discrete Mathematics

Combinatorics

DPP 02 Discussion Notes

01 Question

02 Discussion

Q.1

Among a group of students, 49 study Physics, 37 study English and 21 study Biology. If 9 of these students study Physics and English, 5 study English and Biology, 4 study Physics and Biology and 3 study Physics, English and Biology, find the number of students in the group. [MCQ]

A. 91

B. 92

C. 86

D. None of these

49 → P

37 → E

21 → B

9 → P ∩ E

5 → E ∩ B

4 → P ∩ B

3 → P ∩ E ∩ B

$P \cup E \cup B$

$= P + E + B - P \cap E - P \cap B - B \cap E + P \cap E \cap B$

$= 49 + 37 + 21 - 9 - 5 - 4 + 3$

$= 110 - 18 = 92$

49
37
21
107

Q.2 A large software development company employs 100 computer programmers. Of them, 45 are proficient in Java, 30 in C#, 20 in Python, six in C# and Java, one in Java and Python, five in C# and Python, and just one programmer is proficient in all three languages above.

Determine the number of computer programmers that are not proficient in any of these three languages. **[NAT]**

$non = 100 - Pro$

$= 100 - 84 = \underline{16}$

$Pro = 45 + 30 + 20 - 6 - 1 - 5 + 1$

$= 84$

Q.3

In a discrete mathematics class every student is a major in computer science or mathematics or both. The number of students having computer science as a major (possibly along with mathematics) is 25; the number of students having mathematics as a major (possibly along with computer science) is 13; and the number of students majoring in both computer science and mathematics is 8 . How many students are in the class? **[NAT]**

$25 + 13 - 8$

$= 38 - 8 = 30$

$$\begin{array}{r} 25 \\ +13 \\ \hline 38 \end{array}$$

Q.4

I. Computes the total number of elements that satisfy at least one of several properties. (T)

II. It prevents the problem of double counting. (T)

The number of properties that are true with respect to inclusion exclusion principle are?

[NAT]

Q.5 The number of positive integers not exceeding 100 that are either odd or the square of an integer is _____. [MCQ]

A. 63

B. 59

C. 55

D. 50

$n(O) = 50$

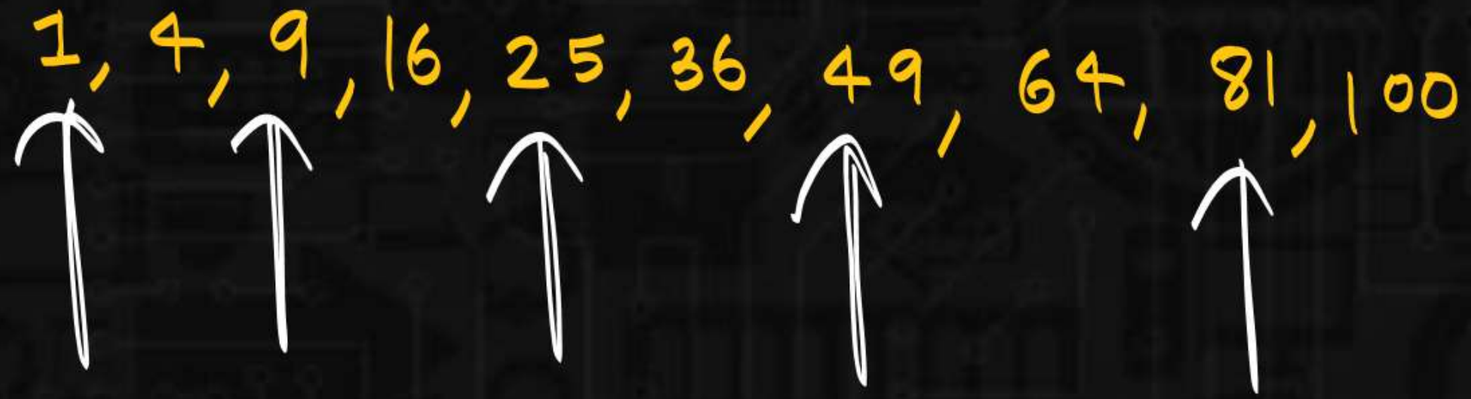
$n(S) = 10$

$n(O \cap S) = 5$

$50 + (10 - 5)$

$= 50 + 5$

$= 55$




THANK YOU GW
SOLDIERS !