Past year questions form Sets and Cartesian Products

3 JEE Main 2021 (Online) 26th August Morning Shift
MCQ (Single Correct Answer)

Out of all patients in a hospital 89% are found to be suffering from heart ailment and 98% are suffering from lungs infection. If K% of them are suffering from both ailments, then K can not belong to the set :

A {80, 83, 86, 89}

B {84, 86, 88, 90}

C {79, 81, 83, 85}

D {84, 87, 90, 93}

Explanation

$n(A \cup B) \geq n(A) + n(B) - n(A \cap B)$

$100 \geq 89 + 98 - n(A \cup B)$

$n(A \cap B) \geq 87$

$87 \leq n(A \cap B) \leq 89$

Concepts used here are simple set theory results.

NOTE: Although there are almost no question specifically from cartisian products, but it is a concept that helps in more complex problems from relations and functions. So do learn it.