

Assignment 2

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Download all python codes from

<https://github.com/Digjoy12/probability/blob/main/Assignment%202/main.py>

and latex codes from

<https://github.com/Digjoy12/probability/blob/main/Assignment%202/main.tex>

Therefore,

Overall probability of randomly choosing elements from set A and set B such that $\Pr(X = 0)$ is

$$\Pr(X = 0) = \Pr(A + B = 16) \quad (7.3)$$

$$\Pr(X = 0) = 1 \times \frac{1}{5} \quad (7.4)$$

$$\Pr(X = 0) = \frac{1}{5} = 0.2 \quad (7.5)$$

GATE PROBLEM-7

Given set $A = [2, 3, 4, 5]$ and set $B = [11, 12, 13, 14, 15]$, two numbers are randomly selected, one from each set. What is the probability that the sum of the two numbers equals 16?

(a) 0.20 (b) 0.25 (c) 0.30 (d) 0.33

X	0	1
Pr(X)	$\frac{1}{5}$	$\frac{4}{5}$

TABLE 0: Probability distribution table

Therefore, the correct option is (a).

SOLUTION

Given,

Set $A = [2, 3, 4, 5]$

Set $B = [11, 12, 13, 14, 15]$

Total number of element in the sample space is 20.

Let us define a random variable $X \in \{0, 1\}$

$X=0$	the event when $A+B=16$
$X=1$	the event when $A+B \neq 16$

TABLE 0: Random Variables

Now, probability of selecting an element from set A such that $\Pr(X = 0)$ is

$$\Pr(X = 0) = \Pr(A + B = 16) = 1 \quad (7.1)$$

So, the probability of selecting an element from set B after selecting an element from set A such that $\Pr(X = 0)$ is

$$\Pr(X = 0) = \Pr(A + B = 16) = \frac{1}{5} \quad (7.2)$$