Assignment 10-Probability and Random Variable

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Download latex code from here-

https://github.com/annu100/AI5002−Probability−and−Random−variables/tree/main.tex/ASSIGNMENT_10

I. Problem Statement-Gate 10

Let X and Y denote the sets containing 2 and 20 distinct objects respectively and F denote the set of all possible functions defined from X to Y.let f be randomly chosen from F .The probability of f being one-to-one is .....

II. SOLUTIONS

Function: X $\rightarrow$ Y
$|Y|$=20
$|X|$=2
total number of functions: = 20^2 = 400
total number of one-one functions:

$$^{|Y|}P_{|X|} = {}^{20}P_2 \tag{1}$$
$$= 380. \tag{2}$$
$$\tag{3}$$

Probability=$\frac{380}{400}$= 0.95.

Another way to see this:

Every element of X can take any of the 20 values.
Total=20*20=400.

For one-one function,Every element of X takes a different value.
so,total one to one functions are =20*19=380.
And thus probability is
Probability=$\frac{380}{400}$=0.95