Assignment

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Two defective bulbs are present in a set of five bulbs. To remove the two defective bulbs, the bulbs are chosen randomly one by one and tested. If X denotes the minimum number of bulbs that must be tested to find out the two defective bulbs, then $\Pr(X = 3)$ (rounded off to two decimal places) equals

Solution:

RV	Values	Description
A	0	1^{st} Bulb defective
	1	1^{st} Bulb non-defective
B	0	2^{nd} Bulb defective
	1	2^{nd} Bulb non-defective
C	0	3^{rd} Bulb defective
	1	3^{rd} Bulb non-defective

TABLE I
RANDOM VARIABLE DECLARATION.

Hence,

$$\Pr(X = 3) = p_{ABC}(1,0,0) + p_{ABC}(0,1,0) + p_{ABC}(1,1,1) \tag{1}$$

$$= \frac{3}{5} \times \frac{2}{4} \times \frac{1}{3} + \frac{2}{5} \times \frac{3}{4} \times \frac{1}{3} + \frac{3}{5} \times \frac{2}{4} \times \frac{1}{3} \tag{2}$$

$$= \frac{3}{10} \tag{3}$$