

Assignment-4

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Download all python codes from

<https://github.com/spdanda/AI1103/tree/main/Assignment2/codes>

and latex-tikz codes from

<https://github.com/spdanda/AI1103/blob/main/Assignment2/Assignment2.tex>

$$= \frac{1}{4} \times \frac{45}{59} \quad (0.0.4)$$

$$= \frac{45}{236} \quad (0.0.5)$$

∴ Option 2 is correct.

GATE 2021(ME-SET2) Q7 :

A box contains 15 blue balls and 45 black balls. If two balls are selected randomly, without replacement, the probability of an outcome in which the first ball selected is a blue ball and the second ball selected is a black ball, is

1. $\frac{3}{16}$
2. $\frac{45}{236}$
3. $\frac{1}{4}$
4. $\frac{3}{4}$

Solution :

Let X_1 and $X_2 \in \{0, 1\}$ where 0 represents a black and 1 represents a blue ball.

a) Probability of picking a blue ball

$$\Pr(X_1 = 1) = \frac{15}{60} = \frac{1}{4} \quad (0.0.1)$$

b) Probability of picking a black ball given a blue ball is picked

$$\Pr(X_2 = 0 | X_1 = 1) = \frac{45}{59} \quad (0.0.2)$$

c) Probability that first ball is blue and second ball is black

$$\begin{aligned} \Pr(X_1 = 1, X_2 = 0) &= \\ \Pr(X_1 = 1) \times \Pr(X_2 = 0 | X_1 = 1) & \\ (0.0.3) \end{aligned}$$