EE23010 Assignment

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Question 62
Let X be a random variable with cumulative distribution function

$$F(x) = \begin{cases} 0 & \text{if } x < -1 \\ \frac{1}{4}(x+1) & \text{if } -1 \leq x < 0 \\ \frac{1}{4}(x+3) & \text{if } 0 \leq x < 1 \\ 1 & \text{if } x \geq 1 \end{cases} \quad (1)$$

Which one of the following statements is true?

(A)

$$\lim_{n\to\infty} \Pr\left(-\frac{1}{2} + \frac{1}{n} < X < -\frac{1}{n}\right) = \frac{5}{8} \quad (2)$$

(B)

$$\lim_{n\to\infty} \Pr\left(-\frac{1}{2} - \frac{1}{n} < X < \frac{1}{n}\right) = \frac{5}{8} \quad (3)$$

(C)

$$\lim_{n\to\infty} \Pr\left(X = \frac{1}{n}\right) = \frac{1}{2} \quad (4)$$

(D)

$$\Pr(X = 0) = \frac{1}{3} \quad (5)$$

(GATE ST 2023)

Solution: