AI1103 - Assignment 4

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Download all latex-tikz codes from

https://github.com/rajasekhar156/assignment−4/blob/main/main.tex

QUESTION:GATE 2001 (EC), Q. 1.20
The PDF of a Gaussian random variable X is given by $P_X(x) = \frac{1}{3\sqrt{2\pi}} e^{\frac{-(x-4)^2}{18}}$ .The probability of the event X = 4 is

1) $\frac{1}{2}$
2) $\frac{1}{3\sqrt{2\pi}}$
3) 0
4) $\frac{1}{4}$

ANSWER:
Given PDF function is

$$P_X(x) = \frac{1}{3\sqrt{2\pi}} e^{\frac{-(x-4)^2}{18}} \tag{0.0.1}$$

Since continuous probability functions are defined for an infinite number of points over a continuous interval, the probability at a single point is always zero.

$$\Pr(x) = \lim_{\delta \to 0} \int_{x}^{x+\delta} \frac{1}{3\sqrt{2\pi}} e^{\frac{-(x-4)^2}{18}} \, dx \tag{0.0.2}$$

$$= 0 \tag{0.0.3}$$

Hence the probability is 0.