Subject . سید عباس صرفاسمی - ۹۷۲۴۴۰۷۸ Year. Month. Day.

$E = 1.96 \times \frac{\sqrt{25}}{\sqrt{2}} = 4.5V \longrightarrow (44.2 - 4.5V < 44.2 + 4.5V)$ ۱۱

$P(x+1;\lambda) = \frac{e^{-\lambda}\lambda^{x+1}}{(x+1)!} = \frac{\lambda}{x+1} \times \frac{e^{-\lambda}\lambda^{x}}{x!} = \frac{\lambda}{x+1} \times P(x;\lambda)$ ۱۲

$P(0;2) = \frac{e^{-2}2^{0}}{1} = e^{-2} = 0.135$

$P(1;2) = \frac{2}{1} \times e^{-2} \quad / \quad P(2;2) = \frac{2}{1} \times \frac{2}{2} \times e^{-2} = 0.27$

۳) این توزیع پواسن است $\mu = E(x) = 4$ و $\sigma = 2$

$P(22 \le \sum x_i < 244)$

$n = 49 \longrightarrow P\left(\frac{22}{49} < \frac{\sum x_i}{n} < \frac{244}{49}\right) = P(4.48 < \bar{x} < 4.98)$

$= P\left(\frac{4.48-4}{\frac{2}{\sqrt{49}}} < \frac{\bar{x}-\mu}{\frac{\sigma}{\sqrt{n}}} < \frac{4.98-4}{\frac{2}{\sqrt{49}}}\right) = P(1.4 < Z < 2.45) = P(Z<2.45) - P(Z<1.4)$

$= 0.9929 - 0.9192 = 0.0737$

۴) $P = (0.98)^{50} = 0.3715$

۵) $P(-b < t < b) = 0.9 \rightarrow P(t > b) = 0.05 \rightarrow b = 1.833$

۶) $\sum_{i=1}^{N} i = \frac{N(N+1)}{2} \quad / \quad \sum_{i=1}^{N} i^2 = \frac{N(N+1)(2N+1)}{6}$

$E[\bar{x}] = \mu = \sum i \times \frac{1}{N} = \frac{N+1}{2} \quad / \quad E[x^2] = \frac{(N+1)(2N+1)}{6}$

$\sigma^2 = \frac{(N+1)(2N+1)}{6} - \left(\frac{N+1}{2}\right)^2 = \frac{(N+1)(N-1)}{12}$

$Var(\bar{x}) = \frac{\sigma^2}{n} = \frac{(N+1)(N-1)}{12n} \quad / \quad E[n\bar{x}] = nE[\bar{x}] = \frac{n(N+1)}{2}$

$Var[n\bar{x}] = n^2 Var[\bar{x}] = n^2 \times \frac{(n+1)(n-1)}{12n} = \frac{n(n+1)(n-1)}{12}$

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سید عباس میرقاسمی ـ ۹۷۲۴۳۰۷۸

Subject . Year. Month. Day.

۷) $\lambda = \frac{1}{4} \longrightarrow P(x>4) = e^{-\frac{1}{4}\times 4} = e^{-1}$

۸) $f(x) = Ae^{-(x^2-8x+12)} = Ae^{\frac{-1}{2}\left(\frac{x-4}{\frac{1}{\sqrt{2}}}\right)^2} = \frac{1}{\sigma\sqrt{2\pi}} e^{\frac{-1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$

$\begin{cases} \mu = 4 \\ \sigma = \frac{1}{\sqrt{2}} \\ A = \frac{1}{\sigma\sqrt{2\pi}} = \frac{1}{\frac{1}{\sqrt{2}}\sqrt{2\pi}} = \frac{1}{\sqrt{\pi}} \simeq 0.564 \end{cases}$

۹) $P(x;\lambda) \times \frac{\lambda}{x+1} = P(x+1;\lambda) \longrightarrow P(1) = \frac{\lambda}{2} \times \frac{\lambda}{1} \times P(0) = \frac{\lambda^2}{2} P(0)$

$P(2) = 2P(0) \longrightarrow \lambda = 2$

$P(x^2+x-20) = P(x>1 \text{ یا } x<-2) = P(x>1) + P(x<-2) = P(x>1)$

$= 1 - P(0) = 1 - e^{-2} = \boxed{1-e^{-2}}$

۱۰ـ الف) $\lambda = \frac{4}{20} \times 7 \longrightarrow P(0) = \frac{(2\lambda)^0 \times e^{-2\lambda}}{1} = \boxed{e^{-\frac{14}{10}}}$

ب) تدریس نشده است!

ج) $\lambda = \frac{2}{10} \times 4 \longrightarrow P(0) = e^{-\frac{2}{10}} = e^{-\frac{1}{5}}$

۱۱) $\frac{1}{6} = P$ انتخاب درست $\longrightarrow$ کل حالات $= 6 = \frac{4!}{2!\times 2!}$

$P = \frac{5}{6}\times\frac{5}{6}\times\frac{1}{6} + \frac{5}{6}\times\frac{1}{6} + \frac{1}{6}$ واردشدن در دقیقه ۵۰

$= \frac{25+30+36}{216} = \frac{91}{216}$

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