長庚大學期中、期末考試答案用紙

科目 機率與統計

108 學年度 第 2 學期 考 次 2 系 姓名 陳允翔 學號 B07290048

1.

(a) $f_Z(z) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(z-\mu)^2}{2\sigma^2}}$

$= \frac{1}{1\cdot\sqrt{2\pi}} e^{\frac{-(z-0)^2}{2\cdot 1^2}} = \frac{1}{\sqrt{2\pi}} e^{\frac{-z^2}{2}}$

(b). $P(-1 \le z \le 1) = 0.6826$

(c). $P(-x \le z \le x) = 95\% \Rightarrow P(0 \le z \le x) = 0.475 \Rightarrow X = 1.906$

(d). $f_Q(q) = \frac{\sqrt{2}}{2} \cdot \frac{1}{\Gamma(\frac{1}{2})} \cdot x^{-\frac{1}{2}} \cdot e^{-\frac{x}{2}}$

(e). $E[Q] = V = 1$

(f). $Std[Q] = \sqrt{\sigma^2}$, $\sigma^2 = 2V$, $Std[Q] = \sqrt{2}$

(g). $P(Q \le 1) \fallingdotseq 30\%$

2 $\beta = 1$

(a). $f_T(t) = e^{-t}$

(b). $E[T] = \beta = 1$

(c). $Std[T] = 1$

(d). $P(T > 1) = 1 - e^{-1} \fallingdotseq 0.6332$