Assignment 0

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

1) Suppose $A$ and $B$ are two events on a sample space $S$ with the probabilities $P(A)$ and $P(B)$ respectively. If $A$ and $B$ are independent, then $P(A \cap B)$ is equal to
   - $P(A) + P(B)$
   - $0$
   - $P(A)P(B)$
   - $P(A) - P(A)P(B)$
   - $P(A) + P(B) - P(A)P(B)$

   The answer is incorrect. Score: 0

   Accepted Answers:
   - $P(A)P(B)$
   - $P(A) - P(A)P(B)$

2) $X$ is a real random variable with the probability density function $f_X(x) = \begin{cases} \frac{c x^{a-1}}{\Gamma(a)}, & x > 0 \\ 0, & \text{otherwise} \end{cases}$

   where $c$ is a constant. The value of $c$ is
   - $1$
   - $2$
   - $\frac{1}{\Gamma(a)}$
   - $\frac{1}{\Gamma(a)} - 1$

   The answer is incorrect. Score: 0

   Accepted Answers:
   - $\frac{1}{\Gamma(a)}$

3) The response $y(n)$ of a discrete time system to an input $x(n)$ is given by $y(n) = n x(n)$. The system is
   - non-linear
   - time-varying
   - stable
   - non-causal

   The answer is incorrect. Score: 0

   Accepted Answers:
   - time-varying

4) The impulse response $h(n)$ of a sequence is given by $h(n) = \begin{cases} 1, & n = 0 \\ \frac{1}{n}, & n = 1 \\ 0, & \text{otherwise} \end{cases}$. The transfer function $H(z)$ of the system and the corresponding region of convergence (ROC) are
   - $H(z) = 1 + \frac{1}{z}, \text{ ROC } |z| > 0$
   - $H(z) = 1 + \frac{1}{z^{-1}}, \text{ ROC } |z| > 0$
   - $H(z) = 1 + \frac{1}{z^{-1}}, \text{ ROC } |z| > \frac{1}{2}$
   - $H(z) = 1 + \frac{1}{z}, \text{ ROC } |z| < 1$

   The answer is incorrect. Score: 0

   Accepted Answers:
   - $H(z) = 1 + \frac{1}{z^{-1}}, \text{ ROC } |z| > 0$

5) $X$ and $Y$ are two uncorrelated random variables. Then
   - $f_{X,Y}(x,y) = f_X(x)f_Y(y)$ for all $x, y \in \mathbb{R}^2$
   - $f_{X,Y}(x,y) = F_X(x)F_Y(y)$ for all $x, y \in \mathbb{R}^2$
   - $EXEY$ for all $x, y \in \mathbb{R}^2$
   - $EXEY = 0$

   The answer is incorrect. Score: 0

   Accepted Answers:
   - $EXEY = EXEY$