
Time: 20 mins

Name:

Std. Number:

Retake Quiz 1 (Review Probability and Signals)

Questions

1. Suppose that m and n are positive integers. What is the probability that a randomly chosen positive integer less than mn is not divisible by either m or n ? (9 points)
2. A simple example of a random variable is the *indicator* of an event A , which is denoted by I_A :

$$I_A(\omega) = \begin{cases} 1, & \text{if } \omega \in A \\ 0, & \text{Otherwise.} \end{cases}$$

- (a) Prove that two events A and B are independent if and only if the associated indicator random variables, I_A and I_B are independent. (5 points)
 - (b) If $X = I_A$, find $E[X]$. (3 points)
3. A system G is described by the difference equation $y[n] = nu[n]$. Determine whether the system is a) memoryless, b) causal, and c) time-invariant. (3 points)