# San Jose State University

# Department of Electrical Engineering

# EE250-02

Fall 2019

# Midterm 2

# Duration: 1 hour

##### SOLUTION

# November 6, 2019

## This test consists of four problems.

CLOSED BOOK

### Use of one sheet (double sided) of formula is allowed.

### Last Name:

**First Name:**

### Student ID:

### 

|  |  |
| --- | --- |
| **Problem** | **Grade** |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| Total |  |

Good Luck!

#### Prof. Kamali

**Problem #1 [7 points]:** If is an exponential random variable with unit mean (), find the pdf of .

**Solution:**

,

**Problem #2 [8 points]:** The joint pdf of the continuous random pair is given as follows.

1. Find .
2. Find .

**Solution:**

1

1

1-x

x

Hence .

**Problem #3 [7 points]:** Consider the random pair in which can only take two values of . The marginal pdf of is uniform between and . If and , find and *plot* the pmf of X.

**Solution:**

pdf of : ,

On the other hand

Therefore and .

-1

0.75

0.25

x

1

**Problem #4 [8 points]:** The joint pdf of the continuous random pair is given as follows.

1. Find the marginal pdf’s of and .
2. Are and independent? Why?

**Solution:**



1. Clearly . Thus and are not independent.