

Name:

SECTION A - MULTIPLE CHOICE

- 12% 1. Among the measures of association between two variables we have:
- A. Median
 - B. Variance
 - C. Standard Deviation
 - D. Correlation

- 12% 2. Let X be a discrete random variable. What is the following term?

$$\sum_{j=1}^m x_j f_{X|Y}(x_j|y)$$

- A. the conditional distribution of X given Y
- B. the joint distribution of X given Y
- C. the joint distribution of Y given X
- D. the conditional expectation of X given Y

- 12% 3. For the past 3 months you verified that **every time** the price of stock A raised, the price of stock B dropped. Then, based on your data, what is the $\text{Corr}(A, B)$?
- A. 1
 - B. -1
 - C. 0
 - D. 0.5

SECTION B - TRUE OR FALSE

- 12% 1. Let X and Y be two independent random variables, such that $E[X] = 4$, $E[Y] = 5$, $\text{Var}[X] = 1$ and $\text{Var}[Y] = 2$. Then $\text{Cov}(X, Y) = 0$.
- True False
- 12% 2. Let X and Y be two random variables. If $\text{Cov}(X, Y) = 0$, then X and Y are independent.
- True False

SECTION C - SHORT ANSWER

- 40% 1. Let X be a random variable and

$$\bar{X} = \sum_{i=1}^n \frac{X_i}{n}$$

be its sample average. Show that the sum of the deviations from the sample average is always equal to 0, which means that $\sum_{i=1}^n (X_i - \bar{X}) = 0$.