

## 1.09 Parametric and Non-Parametric Tests of Independence

### Question 1

An investor tests the relationship between the monthly returns of two mutual funds with the null hypothesis that the funds' returns are uncorrelated. After analyzing 51 months of data, the investor believes that the distributions deviate from a normal distribution and calculates a Pearson correlation of 0.7894 and a Spearman correlation of 0.7311. If the critical  $t$ -value at a 5% significance level is 2.010, the *most appropriate* decision is to:

- A. fail to reject the null hypothesis.
- B. reject the null hypotheses since the  $t$ -statistic is close to 7.50.
- C. reject the null hypotheses since the  $t$ -statistic is close to 9.00.

### Question 2

An analyst selects 190 stocks and organizes them by style and market cap in a contingency table:

	Small-cap	Mid-cap	Large-cap	Totals
Growth	30	20	50	100
Value	45	30	15	90
Total	75	50	65	190

Using marginal frequencies, the expected frequency of large-cap growth stock is *closest* to:

- A. 26.3
- B. 34.2
- C. 50.0

### Question 3

An analyst studies the relationship between company size and bond rating to predict bond defaults. The following table represents the number of defaults over a 10-year period:

Rating	Company Size		
	Large Cap	Mid Cap	Small Cap
AAA or A	15	32	51
BBB or BB	24	47	68
High yield	31	55	70

Based on this information, the relative frequency of BBB–BB bond defaults by mid-cap companies, based on all mid-cap company bonds, is *closest* to:

- A. 12.0%
- B. 33.8%
- C. 35.1%

**Question 4**

An investor builds a contingency table for a group of 600 companies based on two variables: inventory valuation method and gross margin. The scaled squared deviation for each combination of these variables is presented below:

Inventory valuation method	Gross margin		
	Low	Average	High
FIFO	2.92	0.60	0.77
LIFO	1.47	0.34	0.34
Weighted average	1.18	0.21	0.35

At a 5% level of significance and based on the chi-square distribution table, the *most appropriate* conclusion is that:

- A. the variables are positively correlated.
- B. the variables are independent of each other.
- C. the chi-square statistic is greater than the critical value.