考　試　科　目	統計學	系　所　別	風險管理與保險學系管理組	考　試　時　間	2 月 18 日（一）第 3 節

1. What are the classical regression assumptions? (20%)

2. What does a p-value mean? Show your understanding of a p-value. (10%)

3. Assume X follows an exponential distribution with a mean $\frac{1}{t}$. This function can be described as follows:

$$f_X(x) = te^{-tx}, 0 < x < \infty$$

What is the expected value of X given $X > 1$? (10%)

4. Do you agree the following statement: "correlation implies causation"? Please clearly specify your reasons. (10%)

5. Suppose a data set contains 8 observations as follows 7.26, 7.27, 7.24, 7.29, 7.28, 7.25, 7.23 and 7.32. Please test whether the mean of these observations is equal to 7.25 under a statistical significance level of 0.05. ($t_{7, 0.025}$= 2.365; $t_{7, 0.010}$= 2.998; $t_{8, 0.025}$= 2.306; $t_{8, 0.010}$= 2.896) (10%)

6. Compare and contrast interval scale and ratio scale. (10%)

7. Assume X and Y follow a joint distribution below:

$$f(x, y) = \begin{cases} = t, & 0 \leq x \leq 3, 0 \leq y \leq 1, 2y \leq x \\ = 0, & \text{otherwise} \end{cases}$$

(1) Find t. (10%)
(2) Find the marginal probability function of Y. (10%)
(3) Find the conditional probability of Y given $X=$ x. (10%)

備　　註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。