國立政治大學 113 學年度 碩士暨碩士在職專班 招生考試試題

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 6 日(二)第 4 節

1. Suppose the density function of random variable T is as follows:

$$f(t) = 0, t < 0$$
$$fe^{-2t}, 0 < t < \infty$$

(a) Find f. (10%)

(b) Find $P\{T > 2\}$. (10%)

2. An academic study shows that a test water well drilled in a particular county should strike water with probability of 0.1. What is the probability that the fourth water strike comes on the sixth well drilled? (15%)

3. Suppose the reaction of a student to a situation in an experiment may take one of the following two forms, X or Y. If an experimenter wishes to estimate the probability p that a student will react in form X and expects p to be 0.6, how many students must be included in the experiment? Assume that the error of estimation is less than 0.08 with probability equal to 0.9 ($z_{0.05}$= 1.645; $z_{0.025}$= 1.96; $z_{0.0099}$= 2.33 ; $\Phi(1.50) = 0.9332, \Phi(1.58) = 0.9429, \Phi(1.64) = 0.9495, where\ \Phi(x) = Pr(X \leq x)$). (15%)

4. Suppose that T_1 and T_2 are random variables and have the joint density function given by

$$f(t_1, t_2) = 6(1 - t_2), 0 \leq t_1 \leq t_2 \leq 1$$
$$0, \text{otherwise}$$

(a) Find $E(T_1)$. (10%)

(b) Find $V(T_2)$. (10%)

(c) Find $E(T_1 - 3T_2)$. (10%)

5. (a) What is an unbiased estimator? (10%)

(b) What is an efficient estimator? (10%)

備註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。