

考試科目	統計學	系所別	風管系 (管理組)	考試時間	2月7日(五)第4節
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1. (30%) Let X be a normal random variable of mean μ and variance σ^2 .
 - (A) Compute the moment generating function (MGF) of X
 - (B) Compute the expected value and variance of X by MGF
 - (C) Compute the skewness and Kurtosis of X

2. (30%) Let Y be a non-negative random variable of mean μ ; X be a random variable of mean μ and variance σ^2 ; and g be a convex function. Show that
 - (A) $P(Y > c) \leq \mu/c$ for any positive real number c
 - (B) $P(|X - \mu| > k\sigma) \leq \frac{1}{k^2}$ for any positive real number k
 - (C) $E(g(X)) \geq g(\mu)$

3. (20%) A coin having probability 0.5 of coming up heads is successively flipped until two of the most recent three flips are heads. Let N denote the number of flips. Find $E[N]$. Note that if the first two flips are heads, then $N = 2$.

4. (20%) Suppose X is a Poisson random variable with mean λ . The parameter λ is itself a random variable whose distribution is exponential with mean 0.5. Compute the probability mass function $P(X = n)$

備

註

- 一、作答於試題上者，不予計分。
- 二、試題請隨卷繳交。