STA 2309 & STA 2310: RISK THEORY CAT 1

1. Explain the following terms as used in risk theory: (4 *marks*)

   (a) Risk aversion

   (b) Risk management

   (c) False accept risk

   (d) Risk acceptance

2. Using the principle of utility theory show that individuals who use logarithmic utility function are risk averse and hence determine their risk aversion coefficient. (4 *marks*)

3. An individual is facing a random loss, X, that is uniformly distributed on $[0;200]$. The individual can buy partial insurance cover against this loss under which the individual would pay $Y = min(X;100)$, so that the individual would pay the loss in full if the loss was less than 100, and would pay 100 otherwise. The individual makes decisions using the utility function $u(x) = x^{1/5}$. Is the individual prepared to pay 80 for this partial insurance cover if the individual's wealth is 300? (6 *marks*)

4. A random variable X, representing claim amount to an insurance company, can be modelled using exponential distribution with parameter θ. Using the mgf recognition technique determine the density function of $S = X_1 + X_2 + \ldots + X_3$, hence determine its mean and variance. (6 *marks*)

5. Find the mean and variance of random variable X where $q = 0.07$ and claim amount is fixed at 40. (4 *marks*)

6. Stating examples differentiate between systematic and unsystematic risk. (6 *marks*)

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