UNIVERSITY OF TEXAS AT AUSTIN

Quiz #4

Please, provide your **final answer only** to the following questions:

Problem 4.1. (2 points) Let the random variable X represent the loss amount. Assume that an insurance policy has no deductible, has a co-isurance α and a policy limit u. Then, in our usual notation, $Y^L = Y^P$. *True or false?*

Problem 4.2. (2 points) In the notation of our tables, let

$$X \mid Y = y \sim N(y, \sigma_X^2),$$
$$Y \sim N(\mu, \sigma_Y^2),$$

for given parameters μ, σ_X, σ_Y. Then,

$$X \sim N(\mu, \sigma_X^2 + \sigma_Y^2).$$

True or false?

Problem 4.3. (2 points) The ground-up loss random variable is denoted by X. An insurance policy on this loss has a **franchise** deductible of d and no policy limit. Then, the expected **policyholder** payment per loss equals

$$\mathbb{E}[X\mathbb{I}_{[X<d]}].$$

True or false?

Problem 4.4. (2 points) Let N denote the Poisson count of the kinds of pizzas ("personal" and "large") ordered from the local pizza parlor. The mean daily total number of ordered pizzas is 120. Most of the orders, in fact 3/4, are for "large" pizzas. Then, the daily number of "personal" pizzas is also Poisson distributed with parameter $\lambda_p = 30$. *True or false?*

Problem 4.5. (2 pts) The ground-up loss random variable is denoted by X. An insurance policy on this loss has a franchise deductible of d and no policy limit. Then, the expected **insurer's** payment per loss equals

$$\mathbb{E}[X \wedge d].$$

True or false?

Problem 4.6. (5 pts) Let us denote the claim count r.v. by N. We are given that N is a mixture random variable such that

$$N \mid \Lambda = \lambda \sim Poisson(\lambda)$$

while Λ is Gamma distributed with mean 4 and variance 8. Then,

(a) $F_N(1) = 7/27$
(b) $F_N(1) = 9/27$
(c) $F_N(1) = 5/9$
(d) $F_N(1) = 5/7$
(e) None of the above