

STA 2492 CREDIBILITY THEORY CAT I

29/18  
 a) An insurance company uses an exponential distribution to model the cost of repairing insured vehicles' that are involved in accidents. find the maximum likelihood estimate of the mean cost, given that the average cost of repairing a sample of 1,000 vehicle was 2,200.  $\bar{x}$  [4 marks]

b) Based on an analysis of past claims. An insurance company believes that individual claims in a particular category for the coming year will have a mean size of ksh. 5, 000, and a standard deviation of ksh.7, 500. Estimate the proportion of claims that will exceed ksh.25, 000, assuming that individual claim size conform to lognormal distribution. [7 marks]

\*c) You are given that the number of claims following a poison distribution, the claim sizes follows a gamma distribution with parameter  $\alpha$  (unknown) and  $\theta = 10,000$ . the number of claims and claim sizes are independent and full credibility standard has been selected so that actual aggregate losses will be with 10% of aggregate losses 95% of the times [5 marks]

\*d) You are given  
 i) Losses following an exponential distribution with the same mean in al years  
 ii) The loss estimation ratio this year is 70%  
 iii) The ordinary deductible for the coming year is  $\frac{4}{3}$  of the current deductible. Compute the loss elimination ratio for the coming year [5 marks]

\*e) Losses follows a Pareto distribution with parameter  $\alpha = 2$  and  $\theta = 1,000$ . For the coverage with policy limit 2,000 and after an inflation rate of 30%. Calculate the after inflation expected cost. [3 marks]

f) The number of claims has a Poisson distribution. The claim size has a Pareto distribution with parameters  $\alpha = 0.5$  and  $\theta = 6$ . the number of claims and claims sizes are independent. The observed pure premium should be within 2% of the expected pure premium 90% of the time. [4 marks]

$2e^{-\lambda x}$   
 $\frac{2\lambda}{2} = \lambda$   
 $1000 = 2200$   
 $E(X) = C(X+1)$

LEP

$\frac{1}{2} = 0$   
 $n = 0$

Mean

$\frac{1}{2} = 2$   
 $n = 12$

$1 - 2 = -2$