**Question 1**

Operational losses for a large international commercial bank broadly consist of losses arising from mismanagement because of its systems and processes in place or maybe there is some possibilities of external events. Clyde Caledonian Bank operations in Bathgate estimates its annual operational losses (in millions) X, follow a continuous spliced distribution expressed as

for 0 < x ≤ 3

f(x)=

for x > 3

for some constants and . A new regulation requires Clyde Caledonian Bank for each year set aside a capital amount equal to E[X l X>a] where a is the 95th percentile of the distribution of X. Calculate the amount of capital should Clyde Caledonian Bank has to set aside to cover its potential operational losses.

**Question 2**

A loss X is partially insured. The insurance policy has an ordinary deductible of 100. The insurance pays 1/2 of loss in excess of 100 up to a loss (not payment) amount of 1000. For a loss X above 1000, the insurance pays X-550. You are given the following limited expected values related to the loss variable X.

E[X] = 2000 E[X Ʌ 900] = 725

E[X Ʌ 550] = 480 E[X Ʌ 450] = 400

E[X Ʌ 100] = 98 E[X Ʌ 1000} = 790

Find the expected amount paid by the insurance when a loss occurs.

**Question 3**

An automobile insurer classifies drivers as good or bad. The number of claims per year for a good driver has a Poisson distribution with a mean of 0.2 and the number of claims per year for a driver randomly chosen from the insurer’s population of bad drivers has a Poisson distribution with mean Ʌ, where Ʌ is uniformly distributed between 1 and 2. The insurer’s portfolio consists of 75% good drivers and 25% bad drivers. A randomly selected driver from the insurer’s portfolio is found to have 0 claims during the past year. Find the probability that this driver will have 0 claims this year.