

## Question #249

Key: C

Because  $0.656 < 0.7654 < 0.773$ , the simulated number of losses is 4. To simulate a loss by inversion, use

$$F(x) = 1 - e^{-(x/\theta)^\tau} = u$$

$$1 - u = e^{-(x/\theta)^\tau}$$

$$\ln(1 - u) = -(x/\theta)^\tau$$

$$x = \theta(-\ln(1 - u))^{1/\tau} = 200(-\ln(1 - u))^{1/2}$$

$$u_1 = 0.2738, x_1 = 113.12$$

$$u_2 = 0.5152, x_2 = 170.18$$

$$u_3 = 0.7537, x_3 = 236.75$$

$$u_4 = 0.6481, x_4 = 204.39$$

With a deductible of 150, the first loss produces no payments and 113.12 toward the 500 limit. The second loss produces a payment of 20.18 and the insured is now out-of-pocket 263.12. The third loss produces a payment of 86.75 and the insured is out 413.12. The deductible on the fourth loss is then 86.88 for a payment of  $204.29 - 86.88 = 117.51$ .

The total paid by the insurer is  $20.18 + 86.75 + 117.51 = 224.44$ .