APPENDIX

APPENDIX: A-1.

Algorithm:

(1)Input values of Theta and Time(t).

(2)Compute the reliability,

$R(t) = \exp(-t/Theta)$.

(3)Print the values of Theta, t and R(t).

(4)Let width of confidence interval(D) = 0.2.

(5)Initialize with zero E(N), Var(N), $E(\hat{R}(t))$, sum(S) and k=5.

(6)Generate a random sample of size k, from exponential distribution with mean Theta.

$X_i = -\,Theta*\log(U)$, $i = 1,2,\ldots,k$.

Where U denotes U(0,1) random numbers.

(7)If $X_i > t$, then $S = S + 1$, $i = 1,2,\ldots,k$.

(8)Compute estimate of R(t),

RTE = S/k.

(9)Compute the estimate of the Var(R(t)),

$S_k = (k-1)^{-1}(S - k*RTE^2)$.

(10)Check whether,

$$k \geq \frac{S_k a_k^2}{D^2}$$, where $a_k \rightarrow a$ as $k \rightarrow \infty$ and a is $100(\alpha/2)\%$ point of standard normal distribution.

If the condition is satisfied, k is required sample size and RTE is the estimate of R(t).

(11)If condition is not satisfied, Generate a random observation X(k+1) from exponential distribution with mean Theta.

If X(k+1) > t, then S = S + 1 and goto step (8).

(12)Repeat the steps (5-11) 500-times and at each stage compute $E(N)=E(N)+k$, $Var(N)=Var(N)+k*k$ and $E(\hat{R}(t))=E(\hat{R}(t))+RTE$.

(13)Compute

$E(N)=E(N)/500$, $Var(N)=Var(N)/500-E^2(N)$ and $E(\hat{R}(t))=E(\hat{R}(t))/500$.

(14)Print values of E(N), Var(N), $E(\hat{R}(t))$.

(15)let D=D-0.02, if $D \geq 0.06$ goto step (5) otherwise goto next step.

(16)Stop.