APPENDIX: A-3.

Algorithm:

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

(2) Compute the reliability,

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

(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.

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

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

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

(8) Compute estimate of R(t),

RTE = EXP(-T/M), Where M=S/k.

(9) Check whether,

$$k \ge \frac{T^2 a_k^2}{M^2 e^{(2T/M)} d^2}$$

, where $a_k \to a$ as $k \to \infty$ 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).

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

S = S + X(k+1) and goto step (8).

(11)Repeat the steps (5–10) 500–times and at each stage compute

$E(N)=E(N)+k$, $Var(N)=Var(N)+k*k$ and $E(\hat{R}(t))=E(\hat{R}(t))+RTE$.

(12)Compute

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

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

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

(15)Stop.