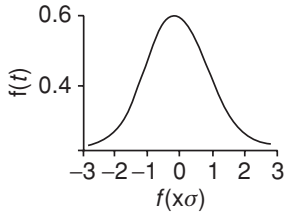
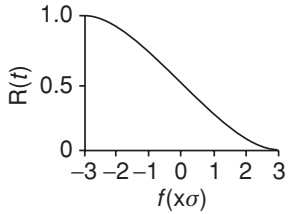
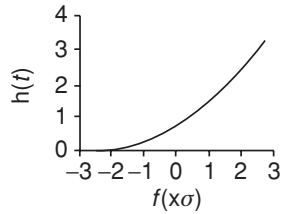
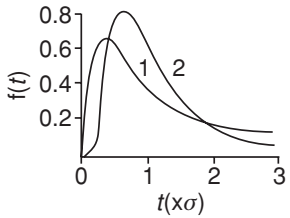
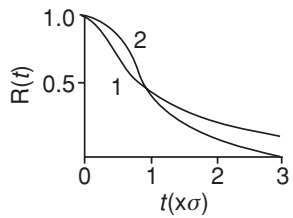
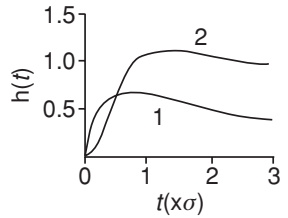
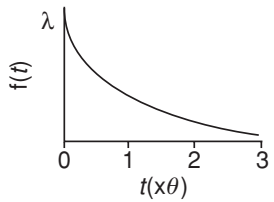
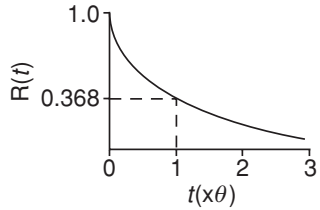
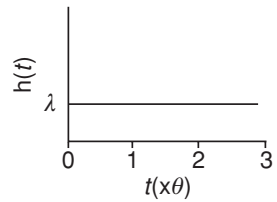
Type of distribution	Parameters	Probability density function, f(t)	Reliability function, R(t) = I – F(t)	Hazard function (instantaneous failure rate). $h(t) = \frac{f(t)}{R(t)}$
Normal	Mean, μ Standard deviation, σ	 $f(t) = \frac{1}{\sigma(2\pi)^{1/2}} \exp\left[-\frac{(t-\mu)^2}{2\sigma^2}\right]$	 $R(t) = \int_t^\infty f(t)\,dt$	 $h(t) = \frac{f(t)}{R(t)}$ (general expression)
Lognormal	Mean, μ Standard deviation, σ	 $f(t) = \frac{1}{\sigma t(2\pi)^{1/2}} \exp\left[-\frac{(\ln t-\mu)^2}{2\sigma^2}\right]$	 $R(t) = \int_t^\infty f(t)\,dt$	 $h(t) = \frac{f(t)}{R(t)}$ (general expression)
Exponential	Failure rate, λ MTBF (=SD), θ $\theta = \lambda^{-1}$	 $f(t) = \lambda \exp(-\lambda t)$	 $R(t) = \exp(-\lambda t)$	 $h(t) = \lambda = \theta^{-1}$

Figure 2.11 *Shapes of common failure distributions, reliability and hazard rate functions (shown in relation to t).*

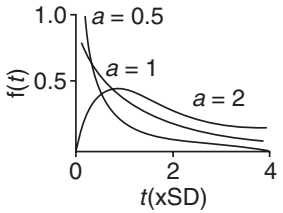
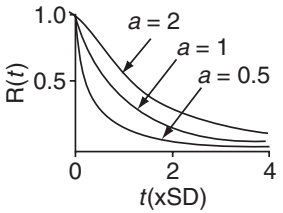
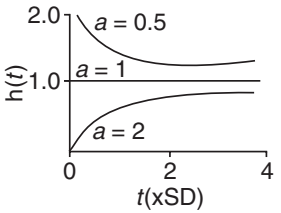
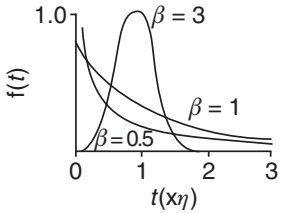
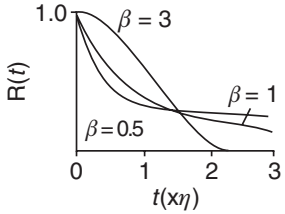
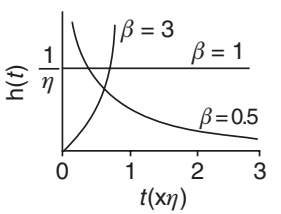
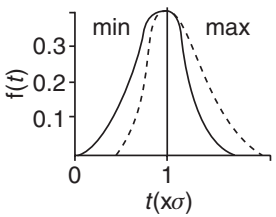
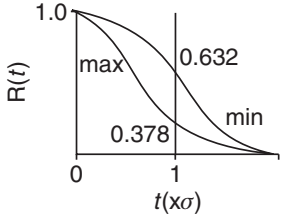
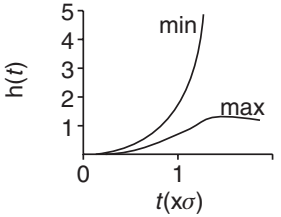
Gamma	Failure rate, λ Events per failure, or Time to ath failure SD = $a^{1/2}/\lambda$ Note: when a is an integer $\Gamma(a) = (a-1)!$	 $f(t) = \frac{\lambda}{\Gamma(a)}(\lambda t)^{a-1}\exp(-\lambda t)$	 $R(t) = \frac{\lambda^a}{\Gamma(a)}\int_t^\infty t^{a-1}\exp(-\lambda t)\,dt$	 $h(t) = \frac{f(t)}{R(t)}$ (general expression)
Weibull	Shape, β Scale (characteristic life), η Location (minimum life), γ Curves shown for $\gamma = 0$	 $f(t) = \frac{\beta}{\eta^\beta}(t-\gamma)^{\beta-1}\exp\left[\left(\frac{t-\gamma}{\eta}\right)^\beta\right]$	 $R(t) = \exp\left[-\left(\frac{t-\gamma}{\eta}\right)^\beta\right]$	 $h(t) = \frac{\beta(t-\gamma)^{\beta-1}}{\eta^\beta}$
Extreme value Type I (shown) Type II is ln (EV) Type III (min) is Weibull	Scale, σ Location (mode), μ SD = 1.283σ Means = $\mu \cdot 0.577\sigma$ + for max – for min			
	Maximum values	$f(t) = \frac{1}{\sigma}\exp\left\{-\frac{1}{\sigma}(t-\mu) - \exp\left[-\frac{1}{\sigma}(t-\mu)\right]\right\}$	$R(t) = 1 - \exp\left[-\exp\left(-\frac{t-\mu}{\sigma}\right)\right]$	$h(t) = \frac{1}{\sigma}\exp\left(-\frac{t-\mu}{\sigma}\right)$
	Minimium values	$f(t) = \frac{1}{\sigma}\exp\left\{\frac{1}{\sigma}(t-\mu) - \exp\left[\frac{1}{\sigma}(t-\mu)\right]\right\}$	$R(t) = \exp\left[-\exp\left(\frac{t-\mu}{\sigma}\right)\right]$	$h(t) = \frac{1}{\sigma}\exp\left(\frac{t-\mu}{\sigma}\right)$

Figure 2.11 *(Continued).*