

1(a)	$e^{-3}(\frac{3^3}{3!} + \frac{3^4}{4!}) = e^{-3}(4.5 + 3.375) = 0.22404 + 0.16803$
	$= 0.392 \text{ (3 sf)}$
1(b)	$\lambda = 5$
	$1 - e^{-5}(1 + 5 + \frac{5^2}{2!}) = 1 - e^{-5}(1+5+12.5)$ $= 1 - (0.0067379 + 0.0336897 + 0.0842243)$
	$= 0.875 \text{ (3 sf)}$
1(c)	$T \sim N(600, 600)$
	$\frac{559.5-600}{\sqrt{600}} [= -1.653]$
	$\Phi(' -1.653') = 1 - \Phi('1.653')$
	$= 0.0492 \text{ (3 sf) or } 0.0491$

3(a)	$\lambda = 1.45$
	$e^{-1.45}(1 + 1.45 + \frac{1.45^2}{2!} + \frac{1.45^3}{3!}) = e^{-1.45}(1+1.45+1.05125+0.5081041)$
	$= 0.94[0] \text{ or } 0.941$
3(b)	$e^{-14500p} \text{ seen or } 2e^{-1.45} [= 0.46914] \text{ seen}$
	$e^{-14500p} = 2e^{-1.45} [\Rightarrow -14500p = \ln 2 + (-1.45)]$
	$p = 0.0000522 \text{ (3 sf)}$

1(a)	Computers are donated independently or singly or randomly
1(b)	$\lambda = 9.6$
	$e^{-9.6} \left(\frac{9.6^7}{7!} + \frac{9.6^8}{8!} \right) = e^{-9.6} (1490.97 + 1789.16) = 0.10098 + 0.12118$
	$= 0.222$ (3 sf)
1(c)	$N(48, 48)$
	$\frac{50.5-48}{\sqrt{48}} [= 0.361]$
	$1 - \Phi(0.361)$
	$= 0.359$ (3 sf)

1	$(\lambda) = 4$
	$e^{-4} \left(1 + 4 + \frac{4^2}{2!} + \frac{4^3}{3!} \right) = e^{-4} (1 + 4 + 8 + 10.6666)$
	$= 0.018316 + 0.073263 + 0.146525 + 0.19537$
	$= 0.433$

5(a)(i)	$e^{-3.5} \left(\frac{3.5^3}{3!} + \frac{3.5^4}{4!} + \frac{3.5^5}{5!} \right) = e^{-3.5} (7.1458 + 6.2526 + 4.37682) =$
	$0.21579 + 0.18881 + 0.13217$
	$= 0.537$
5(a)(ii)	Use of $N(1.2 \times 100 + 2.3 \times 200, \dots) = N(580, \dots)$
	$\text{Var}(S) = 1.2 \times 100 + 2.3 \times 200 = 580$
	$\frac{600.5 - '580'}{\sqrt{'580'}}$
	$= 0.851$
	$1 - \Phi(0.581)$
	$= 0.197$ (3sf)
5(b)	$\frac{5}{2} \times \frac{\lambda^3}{3!} + \frac{\lambda^4}{4!} = \frac{\lambda^5}{5!}$ Or $\left(\frac{5}{2} \right) e^{-\lambda} \left(\frac{\lambda^3}{3!} \right) + e^{-\lambda} \left(\frac{\lambda^4}{4!} \right) = e^{-\lambda} \left(\frac{\lambda^5}{5!} \right)$
	$\lambda^2 - 5\lambda - 50 = 0$
	$(\lambda - 10)(\lambda + 5) = 0$ or $\lambda = \frac{5 \pm \sqrt{25 + 4 \times 50}}{2}$
	$\lambda = 10$