

Question	Answer	Marks	Guidance
(a)(i)	$0.024 \times 50 [= 1.2] \text{ and } 0.018 \times 60 [= 1.08]$	<b>B1</b>	
	$(1 - e^{-1.2}(1 + 1.2)) \times (1 - e^{-1.08}(1 + 1.08))$	<b>M1</b>	For $(1 - e^{-\lambda}(1+\lambda)) \times (1 - e^{-\mu}(1+\mu))$ any $\lambda, \mu$ ( $\lambda \neq \mu$ ) Allow one end error on either or both terms
	$= 0.0991$ (3 sf)	<b>A1</b>	Unsupported answer scores maximum <b>SC B1 B1</b> <b>SC</b> Use of binomial 0.0994 scores B1 only
		<b>3</b>	
(a)(ii)	$\lambda = 0.024 \times 50 + 0.018 \times 60$	<b>M1</b>	or <i>their</i> 1.2 + 1.08 (NB 0.024+0.018 is M0)
	$1 - e^{-2.28} \times \left( 1 + 2.28 + \frac{2.28^2}{2!} + \frac{2.28^3}{3!} \right)$	<b>M1</b>	any $\lambda$ and allow one end error
	$= 0.197$ (3 sf)	<b>A1</b>	Unsupported answer scores maximum <b>SC B2</b>
		<b>3</b>	
(b)	$e^{-\lambda} = [e^{-\mu}]^2 = e^{-2\mu}$	<b>M1</b>	
	$e^{-\lambda} \times \frac{\lambda^2}{2} = k[e^{-\mu} \times \mu]^2$	<b>M1</b>	
	$e^{-2\mu} \times 2\mu^2 = k \times e^{-2\mu} \times \mu^2$	<b>M1</b>	OE. Use of $\lambda = 2\mu$ to find equation in $\mu$ and $k$ only (or $\lambda$ and $k$ only)
	$k = 2$	<b>A1</b>	
		<b>4</b>	