Question Number	Scheme	Marks
2 (a)	$\left[\mathrm{P}(D<108)=\right]\ \mathrm{P}\left(Z<\dfrac{108-112.4}{\sigma}\right)=\ 0.05$	
	$\Rightarrow \dfrac{108-112.4}{\sigma}=-1.6449$	M1 M1
	$\sigma = 2.6749...$ days (calc 2.67501…) awrt 2.67/2.68	A1
		(3)
(b)	$J \sim \mathrm{B}(25,\ 0.05)$	
	$\left[\mathrm{P}(J\ \ldots 4)=\right]1-\mathrm{P}(J\ ,,\ 3)=1-0.9659$	M1
	$= 0.0341$ (calc 0.034090…) awrt 0.0341	A1
		(2)
(c)	$T \sim \mathrm{Po}[200\times"0.0341"]=6.82$ (calc 6.8181…)	M1
	$\left[\mathrm{P}(T\ \ldots 2)=\right]1-\mathrm{P}(X\ ,,\ 1)=1-\left(\mathrm{e}^{-"6.82"}+\mathrm{e}^{-"6.82"}\times"6.82"\right)$	M1
	$= 0.99146\ldots$ calc (0.99144…) awrt 0.991	dA1
		(3)

	Notes	**Total 8**
(a) (i)	**M1**	for standardisation using 108(Condone 107.5), 112.4 and σ set equal to z where $1.5<\lvert z\rvert<2.5$
	M1	for correct equation awrt –1.6449 (Allow awrt 1.6449 if compatible with their equation)
	A1	awrt 2.67/2.68 **NB** M1 M0 A1 is possible
(b)	**M1**	for $1-\mathrm{P}(J\ ,,\ 3)$ or 1 – 0.9659
	A1	awrt 0.0341
(c)	**M1**	for writing or using correct Poisson model ft their part (b) May be implied by 0.00853(73)
	M1	for writing or using $1-\left(\mathrm{e}^{-"\lambda"}+\mathrm{e}^{-"\lambda"}\times"\lambda"\right)$ where $1<\lambda<200$ (may be implied by awrt 0.991) Allow $1-\mathrm{P}(X\ ,,\ 1)$ if Poisson distribution is stated or used
	dA1	dep on both method marks being awarded awrt 0.991 (**NB** Binomial gives awrt 0.992 and if no working shown awrt 0.992 will gain M0M0A0) Allow 0.9915 if both M marks are awarded