Question Number	Scheme	Mark
4 (a)	$\left[\int_a^{a+1}\frac{2}{25}t\ \mathrm{d}t\right]=\frac{2}{25}\left[\frac{t^2}{2}\right]_a^{a+1}$ or $\mathrm{F}(t)=\begin{cases}0 & t<0\\ \frac{1}{25}t^2 & 0\leqslant t<5\\ 1 & t>5\end{cases}$ or $\frac{1}{2}\left(\frac{2}{25}(a+1)+\frac{2}{25}a\right)(a+1-a)$	M1
	$\frac{1}{25}\left((a+1)^2-a^2\right)$ or $\frac{1}{25}(a+1)^2-\frac{1}{25}a^2$ or $\left(\frac{1}{25}a+\frac{1}{25}+\frac{1}{25}a\right)$	M1
	$\frac{1}{25}\left(a^2+2a+1-a^2\right)$ oe $\left[=\frac{1}{25}(2a+1)\right]$*	A1*
		(3)
(b)	H_0 : The data could be modelled by the p.d.f H_1 : The data could not be modelled by the p.d.f	B1
	Expected frequencies: 6, 18, 30, 42, 54	M1 A1
	$\sum\frac{(O-E)^2}{E}=\frac{(10-'6')^2}{'6'}+\ldots+\frac{(68-'54')^2}{'54'}$ or $\sum\frac{O^2}{E}-N=\frac{10^2}{'6'}+\ldots+\frac{68^2}{'54'}-150$ or 2.666…+ 1.388…+ 1.2 + 1.166…+ 3.629	M1
	= 10.05… awrt 10.1	A1
	$\nu=4$	B1
	$\chi_4^2(0.05)=9.488 \Rightarrow \mathrm{CR}\geqslant 9.488$	B1ft
	[In the CR so there is sufficient evidence to reject H_0]	
	Sufficient evidence to say that data does not fit the given p.d.f	dA1
		(8)

	Notes	**Total 11**
(a)	**M1**	For correct integration, ignore limits or finding the area of a trapezium
	M1	For substitution of the limits. May be implied by $\frac{1}{25}\left(a^2+2a+1-a^2\right)$ or simplifying the expression for the area of the trapezium
	A1*	Answer is given so no incorrect working should be seen. At least one correct line of working from the method mark to the final answer should be seen
(b)	**B1**	Both hypotheses correct. Allow H_0 : The p.d.f/ $\mathrm{f}(t)$ is a suitable model H_1 : The p.d.f/ $\mathrm{f}(t)$ is not a suitable model
	M1	For a correct method to find at least one expected frequency e.g. $\frac{1}{25}\times 150$ Ignore any reference to limits
	A1	For all 5 expected frequencies correct
	M1	For an attempt at the test statistic, at least 2 correct expressions/values ft their expected frequencies
	A1	awrt 10.1
	B1	$\nu = 4$ This mark can be implied by a correct critical value of 9.488
	B1ft	9.488 or better ft their DoF
	dA1	Dependent on 2nd M1. A correct conclusion based on their χ^2 critical value If no hypotheses or they are the wrong way round, then A0 here.