Question Number	Scheme	Marks
4(a)	Let X = number of traffic accidents (in 12 months) H_0: $\lambda = 2.5$ (or $\lambda = 10$) H_1: $\lambda \neq 2.5$ (or $\lambda \neq 10$)	B1
	Under H_0: $X \sim$ Po(2.5)	
	Either: $P(X \geqslant 6) = 1 - P(X \leqslant 5)$ $= 1 - 0.9580$ $= 0.0420$ 4.2% > 2.5% Or: $[P(X \leqslant 0) = 0.0821]$ $P(X \geqslant 7) = 1 - 0.9585 = 0.0142$ C.R. is $[X < 0$ and$]$ $X \geqslant 7$ $6 < 7$	M1 A1
	so not significant, do not reject H_0	dM1
	There is no evidence of a change in the rate of **accidents**, OR supermarket **manager's** claim is not rejected.	A1 (5)
(b)	Test is now one-tailed, or now have H_1: $\lambda > 2.5$ (or $\lambda > 10$)	B1
	4.2% < 5% or $[P(X \geqslant 6) = 0.0420$ so$]$ C.R is $X \geqslant 6$. so result is significant, reject H_0	M1ft
	There is evidence of an increase in the rate of **accidents**, OR **resident**'s claim is supported.	A1 (3)
		Total 8

		Notes
(a)	B1	for both hypotheses correct. Must be in terms of λ (or μ) and connected to H_0 and H_1 correctly
	M1	for writing or using Poisson 2.5 and $1 - P(X \leqslant 5)$ (can be implied) or a correct probability statement **leading to a critical region**. NB $P(X \geqslant 7) = 0.0142$ with no CR gets M0
	A1	for correct probability or right hand critical region. Allow awrt 0.0420 Condone 0.042. **NB** Allow M1 A1 for statement $P(X \leqslant 5) = 0.9580$ on its own
	dM1	dependent on 1st M1 for correct decision based on their probability/region and 2.5% (two tail test) or 5% (one tail test). If using $P(X \leqslant 5) = 0.9580$ we must see 0.9580 < 0.975(1-tail) or 0.9580 > 0.95 (2-tail)
	A1	for correct conclusion in context. Words in bold needed. Must be change oe (not increase) Do Not award if one tail test or there are no hypotheses
(b)	B1	If no hypotheses or a 2-tail in (a) this is for recognising that the test is now one-tailed eg hypotheses (condone incorrect letters) New CR or using 5% to compare(must be seen) If 1- tail test in (a) then stating no change or only conclusion changes (must be stated. It is not implied by them repeating the test in (a)
	M1	for correct decision based on their probability/region compared to 5%. Allow ft from their 0.0420 / CR or allow correct value. Do not allow if there are any incorrect non contextual statements
	A1	for correct conclusion in context. Allow number instead of rate but must have increase oe not change, Words in bold needed. **NB** In (a) A correct contextual conclusion on its own gains M1A1 providing previous M1 awarded In (b) A correct contextual conclusion on its own gains M1A1