Question	Scheme	Marks
1(a)	The random variable M is such that $M \sim \text{Po}(2)$	
(i)	$[\text{P}(M \leqslant 3) =] 0.8571$ awrt **0.857**	B1
(ii)	$\text{P}(M \geqslant 6) = 1 - \text{P}(M \leqslant 5)$	M1
	= 0.0166 (calc 0.016563…) awrt **0.0166**	A1
		(3)
(b)	$Q \sim \text{Po}(6)$	M1
	$\text{P}(4 \leqslant Q \leqslant 7) = \text{P}(Q \leqslant 7) - \text{P}(Q \leqslant 3) [= 0.5928]$	M1
	$X \sim$ B(20, "0.5928") **and** P(X = 15) or ${}^{20}C_{15}("0.5928")^{15}(1-"0.5928")^{5}$	M1
	= 0.06809… awrt **0.068**	A1
		(4)
(c)	H_0: $\lambda = 2$ H_1: $\lambda > 2$	B1
	$R \sim \text{Po}(5)$: $\text{P}(R \geqslant 10)$ or $1 - \text{P}(R \leqslant 9)$	M1
	= 0.0318 or CR: $R \geqslant 10$	A1
	Reject H_0 or Significant or in the critical region	M1
	There is evidence to support the **manager's belief** / rate of **customers** arriving at the **garage** has **increased**	A1
		(5)
(d)	The number of tyres bought is likely not to occur singly/tyres are not sold independently.	B1
		(1)
	Notes	**Total 13**

(a)	**B1**	awrt 0.857
	M1	for $1 - \text{P}(M \leqslant 5)$ or 1 – 0.9834 Do not allow $1 - \text{P}(M < 6)$ unless $1 - \text{P}(M \leqslant 5)$ **is** used
	A1	awrt 0.0166 correct answer scores 2 out of 2
(b)	**M1**	for writing or using Po(6)
	M1	for $\text{P}(Q \leqslant 7) - \text{P}(Q \leqslant 3)$ or 0.7440 – 0.1512 or awrt 0.593
	M1	For B(20, "0.5928") **and** P(X = 15) or ${}^{20}C_{15}(p)^{15}(1-p)^{5}$ (implied by awrt 0.068)
	A1	awrt 0.068
(c)	**B1**	for correct hypotheses in terms of λ or μ Allow 5 instead of 2. These must be attached to H_0 and H_1 correctly
	M1	for writing or using Po(5) **and** $\text{P}(R \geqslant 10)$ or $1 - \text{P}(R \leqslant 9)$ (may be implied by awrt 0.0318 or correct CR)
	A1	awrt 0.0318 allow CR: $[R] \geqslant 10$ allow any letter or no letter for CR
	M1	for a correct ft statement consistent with their p-value and 0.05 or with 10 and their CR Need not be contextual but there must be no contradicting non- contextual comments
	A1	dep on 1st and 2nd M1 for a correct conclusion in context which must be rejecting H_0 Must use bold words (oe)
(d)	**B1**	for the idea that tyres may be bought in e.g. pairs oe/the idea that tyre sales are not independent