Question Number	Scheme	Marks
1 (a)	X = faults in a week $\Rightarrow X \sim \text{Po}(6)$	
	$[\text{P}(X \geqslant x) = 0.1528 \Rightarrow \text{P}(X \leqslant x-1)] = 0.8472$	M1
	Using tables $\text{P}(X \leqslant 8) = 0.8472 \Rightarrow x - 1 = 8$	M1
	$x = 9$	A1
		(3)
(b)	Y = faults in six weeks $\Rightarrow Y \sim \text{N}(36, 36)$	B1
	$\text{P}(Y < 32) = \text{P}\left(Z < \dfrac{31.5-36}{6}\right) \quad \left[= \text{P}(Z < -0.75)\right]$	M1 M1
	= 0.2266 awrt 0.227	A1
		(4)
(c)	W = Number of *poor weeks* $\Rightarrow W \sim \text{B}(50, 0.1528)$	B1
	$[\text{P}(W > 1)] = 1 - \text{P}(W \leqslant 1)$	M1
	$= 1 - \left(0.8472^{50} + 50 \times 0.1528 \times 0.8472^{49}\right)$	dM1
	= 0.99748… awrt 0.997	A1
		(4)

	Notes		**Total 11**
1 (a)	**M1**	Writing or using $1 - \text{P}(X \leqslant x - 1)$	
	M1	For 0.8472 May be implied by $x - 1 = 8$	
	A1	$x = 9$	
(b)	**B1**	Writing or using $\text{N}(36, 36)$ (May be implied by a correct standardisation expression)	
	M1	Standardising with 30.5/31/31.5/32/32.5/39.5/40/40.5/41/41.5, their mean and standard deviation (Allow ±)	
	M1	A fully correct standardisation. May be implied by ± 0.75	
	A1	awrt 0.227	
(c)	**B1**	Writing or using $\text{B}(50, 0.1528)$	
	M1	Writing or using $1 - \text{P}(W \leqslant 1)$ (Allow any letter)	
	dM1	Dependent on using binomial. Using $1 - \left[\text{P}(W = 0) + \text{P}(W = 1)\right]$ (implied by awrt 0.997 or 0.9975 or1 – awrt 0.00257) Using binomial may be implied by $(1-p)^{50} + {}^{n}C_{r} \times p \times (1-p)^{49}$ where p is a probability Condone ${}^{n}C_{r}$ missing	
	A1	awrt 0.997 or 0.9975	