Question Number	Scheme	Marks
2. (a)	$[X \sim \text{Po}(2)]$ $\text{P}(X < 5) = \text{P}(X \leq 4)$ $= 0.947346\ldots$ awrt **<u>0.947</u>**	M1 A1 (2)
(b)	$Y \sim \text{Po}(6)$ $e^{-6}\frac{6^n}{(n)!} = e^{-6}\frac{6^{n+1}}{(n+1)!} \rightarrow (n+1) = 6$ **or** $\text{P}(Y=4) = 0.13385\ldots$, $\text{P}(Y=5) = 0.16062\ldots$, $\text{P}(Y=6) = 0.16062\ldots$ **<u>$n = 5$</u>**	B1 M1 A1 (3)
(c)	$[D \sim \text{Po}(9)]$ $\text{P}(c \leq D \leq 12) = \text{P}(D \leq 12) - \text{P}(D \leq c-1)$ or $\text{P}(X \leq d) = 0.8758 - 0.8546 = 0.0212$ $0.8546 = 0.8758 - \text{P}(D \leq c-1)$ $\text{P}(D \leq c-1) = 0.0212$ $\quad$ $\text{P}(X \leq 3) = 0.0212$ $c - 1 = 3$ **<u>$c = 4$</u>** $\quad$ **<u>$c = 4$</u>**	M1 dM1 A1 (3)
(d)	$\text{P}(X = 2) = 0.27067\ldots$ $W \sim \text{B}(6,$ awrt $0.27067\ldots)$ $\text{P}(W = 4) = {}^6\text{C}_4(\text{“}0.27067\ldots\text{”})^4(1 - \text{“}0.27067\ldots\text{”})^2$ $= 0.0428\ldots$ awrt **<u>0.043</u>**	B1 B1ft M1 A1 (4) **[12 marks]**
	Notes	
(a)	M1 for writing or using $\text{P}(X \leq 4)$ If answer is incorrect this must be shown	
(b)	B1 for writing or using Po(6) M1 for a correct expressions for $\text{P}(Y = n)$ and $\text{P}(Y = n + 1)$ using their value of λ or for finding at least 2 of the given probabilities for Po(6) only correct to 3sf. A1 must be only one value of n given. If more than one value of n is given working must be shown to award the B1 and M1, 5 on its own gains B1M1A1	
(c)	1st M1 for the expression $\text{P}(D \leq 12) - \text{P}(D \leq c-1)$ oe Condone $\text{P}(D \leq 12) - \text{P}(D \leq c)$ allow any letters. 2nd dM1 for correct substitution of 0.8758 (awrt 0.876) and 0.8546 leading to $\text{P}(D \leq c-1)$ = a probability. Condone $\text{P}(D \leq c)$ = a probability allow any letters	
(d)	For an awrt 0.043 from correct working award full marks. 1st B1 for awrt 0.271 seen 2nd B1ft Follow through their $\text{P}(X = 2)$ but you must see either B(6, “0.27067…”) or working of the form $(\text{“}0.27067\ldots\text{”})^4(1 - \text{“}0.27067\ldots\text{”})^2$. Condone missing ${}^6\text{C}_4$ **NB** If $\text{P}(X = 2)$ is not stated and 0.271 is not seen do not ft. M1 ${}^6\text{C}_4\, p^4(1-p)^2$ or $\text{P}(W \leq 4) - \text{P}(W \leq 3)$ or $0.9932\ldots - 0.9504\ldots$ written	