Question Number	Scheme	Marks
1(a)	eg $4750\times\frac{80}{40000}$ o.e. $[=9.5]$*	B1*
		(1)
(b)	Two appropriate assumptions. e.g. **Hazelnuts** occur singly **or hazelnuts** occur randomly (independently) **or hazelnuts** are well mixed in **or mean** number of **hazelnuts** (per kg) is **constant or hazelnuts** occur at a constant **rate**	B1 B1
		(2)
(c)(i)	Let X = number of hazelnuts. $X \sim$ Po(9.5)	
	$P(X = 12) = \frac{e^{-9.5}\times(9.5)^{12}}{12!}$	M1
	$= 0.08444\ldots$ awrt 0.0844	A1
(ii)	$P(X \leqslant 7)$	M1
	$= 0.26866\ldots$ awrt 0.269	A1
		(4)
(d)	Let R = number of bars with fewer than 8 hazelnuts. $R \sim$ B(3, 0.2687)	B1
	$P(R = 1) = "0.2687"\times(1 - "0.2687")^2\times 3$	M1
	$= 0.4312\ldots$ awrt 0.431	A1
		(3)
(e)	$Y \sim$ Po(23.75) oe	B1
	$\Rightarrow$ approximately $Y \sim$ N(23.75, 23.75)	M1
	$P(Y \geqslant 30) = P\left(Z > \frac{29.5-23.75}{\sqrt{23.75}}\right)$ [= 1 – P(Z < 1.18)]	M1dM1
	(= 1 – 0.8810) = 0.1190 awrt 0.119	A1
		(5)
		Total 15

		Notes
(a)	B1*	for equivalent working. Allow equation $\frac{x}{4750}=\frac{80}{40000}$ oe. **Answer is given**
(b)	B1 B1	for an assumption in a correct context. Allow equivalent wording with words in bold a second assumption need not be in context. Also ignore in correct context **NB** 2 correct assumptions not in context get **B0B1**
(c)(i)	M1	$\frac{e^{-\lambda}\times(\lambda)^{12}}{12!}$ or writing or using $P(X \leq 12) - P(X \leq 11)$
(ii)	M1	for $P(X \leqslant 7)$ seen or implied by correct answer. Do Not allow P(X < 8) for M1 unless correct answer
(d)	B1 M1	writing B(3, "0.269") or B(3, 1 – "0.269") **or** seeing $("0.269")^n\times(1 - "0.269")^{3-n}\times {}^3C_n$ oe where $1 \leq n \leq 2$ (with their 0.269 or better) Implied by correct answer correct calculation of the form $3pq^2$ where $p + q = 1$. Working to be seen if (c)(ii)wrong
(e)	B1 M1 M1 M1d	for writing or using new mean of 23.75 oe Condone N(23.75, 23.75^2) if used correctly in standardisation for normal approx with changed mean = variance. May be seen in standardisation for $\pm\left(\frac{28.5\,/\,29\,/\,29.5\,/\,30\,/\,30.5 - \textit{their mean}}{\textit{their sd}}\right)$ If they do not have not given a mean and variance they must be correct in here. (allow 1 $\pm$ standardisation) Dep on previous M being awarded. For attempt at continuity correction (condone 30.5 or 28.5)