Question Number	Scheme	Marks
6. i.(a)	n is large and p is small	B1 (1)
(b)	$[X \sim \text{B}(3000, 0.0025) \rightarrow] \; Y \sim \text{Po}(7.5)$ $\text{P}(Y > 7) = 1 - \text{P}(Y \leq 7) = 1 - 0.5246 = 0.47536\ldots$ awrt **0.475**	B1 M1 A1 (3)
ii.(a)	A **list/database/register** of **all employees**	B1 (1)
(b)	The **probability** distribution of the **number of employees** that **cycle** to work [from all possible samples of 150]	B1 (1)
(c)	$D \sim \text{N}(60, 36)$ $\text{P}(C \leq \alpha) = \text{P}(Z \leq z) = 0.0668$ $\frac{\alpha - "60"}{"6"} = -1.5$ or $\frac{"60" - \alpha}{"6"} = 1.5$ **α = 51**	B1 M1 B1 A1cao (4)
(d)	$\text{P}(C \leq 51) = \text{P}(D \leq 51.5)$ $\text{P}\left(Z \leq \frac{"51" - "60" + 0.5}{"6"}\right)$ $= \text{P}(Z \leq -1.42) = 1 - 0.9222$ $= 0.0778/0.0782\ldots$ awrt **0.078**	M1 A1 (2) **[12 marks]**

	Notes
(a)	n is bigger then 10 and $p < 0.25$
i. (b)	B1 for writing or using Po(7.5) M1 for writing or using $1 - \text{P}(Y \leq 7)$ oe
ii (a)	B1 must be **all** employees
(b)	B1 Allow **number of employees** that **cycle** to work and their associated **probabilities**
(c)	1st B1 for Normal approximation with mean = 60 and variance = 36 / standard deviation = 6 M1 for standardising with no continuity correct and equating to z using their mean and sd (if not stated clearly they must be correct here), with $\lvert z \rvert > 1$ 2nd B1 for – 1.5 (or 1.5) Their sign must be compatible with their standardisation. Allow if used their 36 instead of their 6
(d)	M1 for standardising with use of continuity correction 'their 51' + 0.5 allow same mean and sd used in part(c) A1 awrt 0.078