Question	Scheme	Marks
6 (a)	$\left[\bar{x} = \frac{806.4}{36} = \right] 22.4$	B1
	$"22.4" \pm 2.3263 \times \frac{0.4}{\sqrt{36}}$	M1 B1
	(22.24…, 22.55…) awrt (22.2, 22.6)	A1
	NB answers which are awrt (22.2, 22.6) gain full marks	
		(4)
(b)	[The Central Limit Theorem is not required as] the original population is **normally distributed**	B1
		(1)
(c)	22.5 is within the confidence interval	B1 ft
	So no reason to doubt the manufacturers claim	dB1 ft
		(2)
(d)	$\bar{Y} \sim \mathrm{N}\left(850, \left(\frac{5}{\sqrt{10}}\right)^2\right)$	B1
	$\mathrm{P}\left(\bar{Y} < 848\right) = \mathrm{P}\left(Z < \frac{848-850}{\frac{5}{\sqrt{10}}}\right) = [\mathrm{P}(Z < -1.26)]$	M1
	$= 0.1038$ (Calculator gives 0.10295…) awrt 0.103 / 0.104	A1
		(3)
ALT	N(8500, 250)	B1
	$\mathrm{P}\left(\bar{Y} < 848\right) = \mathrm{P}\left(Z < \frac{8480-8500}{\sqrt{250}}\right) = [\mathrm{P}(Z < -1.26)]$	M1
	$= 0.1038$	A1
	Notes	**Total 10**

(a)	**B1**	For 22.4
	M1	For use of $\bar{x} \pm z$ value $\times \frac{\sigma}{\sqrt{n}}$ with $1.2 < z < 2.6$
	B1	For z value = 2.3263 or better seen (Calculator gives 2.3263479…)
	A1	awrt (22.2, 22.6) This does not imply the B1
(b)	**B1**	For reference to the data is modelled by **normal distribution**
(c)	**B1 ft**	ft their CI For a comment on whether 22.5 (or it) is or is not in their CI allow eg range for CI Allow "22.24" < 22.5 < " 22.6" Answer must be compatible with their CI
	dB1 ft	Dependent on B1 ft. For a correct comment ft their CI eg claim is correct oe
(d)	**B1**	for $\bar{Y} \sim \mathrm{N}(850, ...)$ or $\bar{Y} < \frac{848-850}{5}$ Must have $\bar{Y}$ **or** $\mathrm{N}\left(850, \left(\frac{5}{\sqrt{10}}\right)^2\right)$ or $\mathrm{N}(850, 2.5)$ seen or used or N(8500, 250) seen or used. Both implied by a correct standardisation.
	M1	For $\pm$(a correct standardisation) implied by a correct answer
	A1	awrt 0.103 to 0.104