Question Number	Scheme	Marks
3(a)	$\left[\ \bar{y} = \frac{3780}{90} \Rightarrow\right]\ \bar{y} = 42$	B1
	$\left[s_y^{\ 2} =\right] \frac{164599.29 - 90(42)^2}{90-1}$	M1
	$= 65.61$	A1
		(3)
(b)	$H_0 : \mu_W - \mu_E = 0 \qquad H_1 : \mu_W - \mu_E < 0$	B1
	$z = \frac{40 - "42" - 0}{\sqrt{\frac{18.49}{90} + \frac{"65.61"}{90}}}$	M1A1ft
	$= -2.0689\ldots$	A1
	One tailed CV: $Z = -1.6449$ **or** CR: $Z \leqslant -1.6449$	B1
	In CR/Significant/Reject H_0	M1
	Sufficient evidence to support the **zoologist's claim**	A1ft
		(7)
(c)	Assumed that $s^2 = \sigma^2$ for **both** samples	B1
		(1)

	Notes	**Total 11**
(a)	**B1**	for $\bar{y} = 42$
	M1	a correct method for finding an unbiased estimate of the variance e.g. $\frac{\Sigma y^2 - n(\bar{y})^2}{n-1}$
	A1	Cao
(b)	**B1**	both hypotheses correct. Allow equivalent hypotheses. Must be in terms of μ Allow other letters e.g. μ_x and μ_y
	M1	an attempt at $\frac{a-b-0}{\sqrt{\frac{c}{90}+\frac{d}{90}}}$ with at least 2 of a, b, c or d correct. Allow ±
	A1ft	$z = \frac{40 - "42" - 0}{\sqrt{\frac{18.49}{90} + \frac{"65.61"}{90}}}$ Allow ±
	A1	awrt –2.07 (Allow awrt 2.07)
	B1	1.6449 or better seen
	M1	A correct statement ft their test statistic and their CV – need not be contextual but do not allow contradicting non contextual comments. May be implied by a correct contextual statement on its own
	A1ft	A correct contextual statement ft their test statistic and their CV. Must contain zoologist's claim (allow belief) or a correct conclusion based on the zoologists claim with **weight**, **Western** and **Eastern** e.g. the [mean] **weight** of **Western** [grey kangaroos] is less than **Eastern** [grey kangaroos]
(c)	**B1**	for the assumption that sample variance = population variance for **both** samples