Question Number	Scheme	Marks
3 (a)	$\left[p = \frac{118}{40} = \right] 2.95$	B1
	$[q =] \frac{350.05 - 40('2.95')^2}{39} = 0.05$	M1 A1
		(3)
(b)	$H_0 : \mu_A = \mu_B \quad H_1 : \mu_A < \mu_B$	B1
	$z = \pm \frac{2.65 - '2.95'}{\sqrt{\frac{0.07}{50} + \frac{'0.05'}{40}}}$	M1 M1
	$= 5.827...$ or $= -5.827...$ awrt ± 5.83	A1
	CV = 1.6449	B1
	Reject H_0 There is significant evidence to support the biologist's **belief**	M1 A1ft
		(7)
(c)	Large sample sizes so …	
	both sample means are normally distributed (CLT)	B1
	$s_A^2 = \sigma_A^2$ **and** $s_B^2 = \sigma_B^2$	B1
		(2)

	Notes	**Total 12**
(a)	**B1**	2.95 only
	M1	For use of $\frac{\sum x^2 - n\bar{x}^2}{n-1}$ oe ft their $\bar{x}$ May be implied 0.05 provided no incorrect working seen
	A1	cao
(b)	**B1**	Both hypotheses correct. Allow equivalent hypotheses. Must be in terms of μ
	M1	For the denominator. Ft their 0.05
	M1	Fully correct. Ft their 2.95 and their 0.05
	A1	awrt 5.83 allow $\lvert z \rvert = 5.827...$ accept p = 2.8(1) x 10^{-9}
	B1	|CV| =1.6449 or better
	M1	A correct conclusion not in context ft their z value and CV or a correct p value (2 sf)
	A1ft	ft their z value and their CV (NB their CV must be consistent with their z value) or a correct p value (2 sf). Correct conclusion in context, need **belief/claim**. May be in words with **weights** and **region** e.g. the **weights** in **region *A*** are smaller
(c)	**B1**	Must comment on **both** sample means e.g. the sample means are normally distributed
	B1	Must comment on **both** variances/standard deviations e.g. sample variances can be used as values for the population variances