Question Number	Scheme	Marks
6(a)	**Label** full-time staff [1-6000] and part-time staff [1-4000]	M1
	Use random numbers to select	M1
	120 full-time staff and 80 part-time staff	A1
		(3)
(b)	Enables estimation of statistics/errors for each strata or "reduces variability" or "more representative" or "reflects population structure" **NOT more accurate**	B1
		(1)
(c)	$H_0 : \mu_f = \mu_p$ $H_1 : \mu_f \neq \mu_p$	B1
	s.e. = $\sqrt{\frac{21}{80}+\frac{19}{80}}$, $z = \frac{52-50}{\sqrt{\frac{21}{80}+\frac{19}{80}}}\left(=2\sqrt{2}\right)$	M1, M1
	= awrt **2.83**	A1
	C.V. = 2.5758 (or *p*-value awrt 0.002 (<0.005) or awrt 0.004 (<0.01))	B1
	[2.83 > 2.5758 so] significant evidence to reject H_0	dM1
	There is evidence of a difference in policy awareness between full-time and part-time staff	A1ft
		(7)
(d)	$\bar{X}_f$ /Mean score for full-time staff **and** $\bar{X}_p$ /Mean score for part-time staff……	B1
	…..follow (approximate) Normal distributions.	B1
		(2)
(e)	Have assumed $s^2 = \sigma^2$ or variance of sample = variance of population for **both**	B1
		(1)
(f)	[2.53 < "2.5758"] not significant or do not reject H_0	M1
	So there is insufficient evidence of a difference in mean awareness scores	A1ft
		(2)
(g)	Training course has closed the gap between full-time and part-time staff's mean awareness.	B1 (1)
		[17 marks]

Notes

(a)	**M1**	For numbering/labelling/ordering o.e. staff in **each** group. Label all 10000 staff is M0.
	M1	For use of random numbers/random sample/random selection
	A1	(dep on either M mark) 120 full-time **and** 80 part-time
(c)	**B1**	Both hypotheses clearly labelled (allow equivalent e.g. $\mu_f - \mu_p = 0$)
	M1	Attempt at s.e. in the form $\sqrt{\frac{p}{q}+\frac{r}{s}}$ condone one number wrong
	M1	Using their s.e. in correct formula for test statistic. Must be in the form $\frac{\pm(52-50)}{\sqrt{\frac{p}{q}+\frac{r}{s}}}$
	A1	awrt 2.83 allow awrt –2.83
	B1	±2.5758 or better allow appropriate *p*-value if used consistently with correct significance level
	dM1	Dep on previous M1 for a correct statement based on their normal C.V. and their test statistic
	A1ft	For correct comment in context. Must mention "scores" or "awareness" and "types of staff".
(d)	**B1**	For mention of both means
	B1	For stating that distributions of mean(s) can be approximate normal
(f)	**M1**	For correct (ft) statement (may be implied by correct context. comment) ft C.V. from (c)
	A1ft	For correct (ft) contextualised comment with "scores" or "awareness"
(g)	**B1**	Correct comment in context that implies that there is now no (significant) difference in mean scores. Dep on significant result in part (c) and non-significant result in part (f).