Q	Marking instructions	AO	Marks	Typical solution
18(a)	Explains why this test is a one-tailed test. Must be in context. Condone explanation using 'number of' linked to increase	3.2a	E1	If the campaign is effective, then the proportion of under 30s visitors will be greater than 14%. So, a one-tailed test is required.
	Subtotal		**1**	

Q	Marking instructions	AO	Marks	Typical solution
18(b)	States both hypotheses correctly for a one-tailed test. Accept population proportion for p. Accept 14%, but not $x =$ or $\overline{x} =$ or $\mu =$	2.5	B1	X is 'No of under 30's visitors to the website' H_0: p = 0.14 H_1: p > 0.14 Under H_0: $X \sim B(60, 0.14)$ $P(X \geq 15) = 1 - P(X \leq 14)$ $= 1 - 0.98351 \ldots$ $= 0.01649$ $= 0.0165$ As $0.0165 < 0.05$ Reject H_0 There is sufficient evidence to suggest that the advertising campaign has been effective.
	States model used (PI by 0.016(5), 0.0071(5), 0.035, 0.0029, 0.0093) (AWRT)	1.1a	M1	
	Evaluates using calculator = 0.016(5) (AWRT) (condone 0.0071(5) for A1)	1.1b	A1	
	Compares 0.016(5) to 0.05 and rejects H_0. (PI)(CSO) No ft here. Must see clear comparison (inequality or diagram)	3.5a	A1	
	Concludes correctly in context CSO 'sufficient evidence' OE required. Only award for full complete correct solution.	3.2a	R1	
	Subtotal		**5**	

Q	Marking instructions	AO	Marks	Typical solution
18(c)	Recalls that the sample would need to be Random. Accept 'not biased' OE	1.2	E1	The sample would need to be a Random sample
	Subtotal		**1**	

	Question Total		**7**	