Question	Answer	Mark	AO	Guidance
10	H_0: $p = 0.9$, where $p = $ P(a random customer is satisfied)	**B1**	**1.1**	**Allow rounded or truncated to 2 sf throughout** or p is proportion satisfied Allow other letters
	H_1: $p < 0.9$	**B1**	**2.5**	OR $p = 90\%$, where p is % of customers satisfied Subtract B1 for each error eg: 2-tail B1B0 Use of $\leq$ with definition B1B0 undefined p B1B0 Not include value 0.9 B0B0 not in terms of parameter B1B0 $H_0 = 0.9$ etc: B0B0
	$X \sim \text{Bin}(15, 0.9)$ and $X \leq 10$ or 11 or 12 (condone $<$ or $=$ or $>$ or $\geq$)	**M1**	**3.3**	Stated or implied eg by 0.0556 or 0.184 or 0.0127 or 0.944 or 0.816 or 0.987 or 0.0428 or 0.129
	P($X{\leq}11$) oe | P($X{>}11$) oe $= 0.0556$ | $= 0.944$	**A1**	**3.4**	**BC** cao
	Comp 0.05 | Comp 0.95	**A1**	**1.1**	Dep 0.0556 or 0.184 or 0.0127 or 0.944 or 0.816 or 0.987 Must be correct comparison, eg not 0.944 comp with 0.05
	Alternative method for middle two A-marks P($X \leq 10$) = 0.0127 P($X \leq 11$) = 0.0556	**A1**		Both needed
	Hence rejection region is $X \leq 10$ (or $X < 11$) or critical value is $X = 10$	**A1**		Dep on M1
	Do not reject H_0 Condone Accept H_0	**M1**	**1.1**	Dep 0.0556 or 0.184 or 0.0127 **(2 sf)** or P($X \leq 10$ or 11 or 12)seen or 0.944 or 0.816 or 0.987 P($X > 10$ or 11 or 12) seen And dep correct comparison, eg, not 0.944 comp with 0.05
	There is insufficient evidence that Pierre is overconfident (or that $< 90\%$ are satisfied) oe, eg There is insufficient evidence that Yvette's suspicion is correct	**A1f**	**2.2b**	In context. Not definite. Full statement Not: There is evidence that Pierre is not overconfident oe
		[7]		
	$N \sim \text{Bin}$: $\mu = 13.5$, $\mu < 13.5$ B1B0			dep defined μ. If undefined: B0B0
	$N(13.5, 1.35)$ & $X = 11.5$ or 11 M1			soi
	$p = 0.0426$ A1			
	compare 0.05 A1			dep 0.0426 or 0.0157
	Conclusion M0A0			

	Question		Answer	Mark	AO	Guidance
10	ctd		2-tail: H$_0$: $p = 0.9$ defined p H$_1$: $p \neq 0.9$	B1 B0		
			$X \sim$ Bin(15, 0.9) and $X \leq 11$ or 12 (condone $<$ or $=$ or $>$ or $\geq$) P($X \leq 11$) oe $= 0.0556$ Comp 0.025 Conclusion	M1 A1 A1 M0 A0		Stated or implied eg by 0.0556 or 0.184 or 0.944 or 0.816 or 0.0428 or 0.129 Dep 0.0556 or 0.184