

Q	Marking instructions	AO	Marks	Typical solution
19(a)(i)	States $H_0 : p = 0.8$ $H_1 : p \neq 0.8$	2.5	B1	$H_0 : p = 0.8$ $H_1 : p \neq 0.8$
	Subtotal		1	

Q	Marking instructions	AO	Marks	Typical solution
19(a)(ii)	<p>States or uses correct model</p> <p>PI by calculation of one of $P(X \leq x)$ where $x = [1, 24]$ or $P(X \geq x)$ where $x = [1, 25]$ or $P(X = x)$ where $x = 0$ or 25 or by critical region of $x \leq 16$ or $x \geq 24$</p>	3.3	B1	$X \sim B(25, 0.8)$ $P(X \leq 15) = 0.0173 < 0.05$ $P(X \leq 16) = 0.0468 < 0.05$ $P(X \leq 17) = 0.1091 > 0.05$ $P(X \geq 23) = 0.0982 > 0.05$ $P(X \geq 24) = 0.0274 < 0.05$ $P(X \geq 25) = 0.0038 < 0.05$
	<p>Obtains one of (List 1) [0.017, 0.0174] or [0.046, 0.047] or [0.109, 0.11] or [0.098, 0.0983] or [0.027, 0.0274] or [0.0037, 0.0038] or obtains one of (List 2) [0.982, 0.983] or [0.953, 0.954] or [0.890, 0.891] or [0.901, 0.902] or [0.97, 0.973] or [0.996, 0.9963]</p> <p>PI by critical region of $x \leq 16$ or $x \geq 24$ Ignore labels</p>	1.1a	M1	Critical region is $x \leq 16, x \geq 24$
	<p>Compares one probability from List 1 with 0.05 or compares one probability from List 2 with 0.95</p> <p>PI by critical region of $x \leq 16$ or $x \geq 24$</p>	1.1a	M1	
	Obtains one of the critical regions of $x \leq 16$ or $x \geq 24$	1.1b	A1	
	<p>Obtains both critical regions $x \leq 16, x \geq 24$</p> <p>Accept critical region of $x < 17$ or $0 \leq x < 17, x > 23$</p> <p>Condone use of any letter for x or stating ≤ 16 or ≥ 24 throughout</p>	3.2a	A1	
	Subtotal		5	

Q	Marking instructions	AO	Marks	Typical solution
19(a)(iii)	<p>Concludes correctly in context from a fully correct comparison</p> <p>Conclusion must not be definite, eg use of 'suggest', 'support' etc</p> <p>Follow through the correct comparison of 18 with their critical region from part 19(a)(ii)</p> <p>The comparison does not need to be seen</p>	2.2b	E1F	There is insufficient evidence to suggest that proportion of diesel cars registered in 2022 with CO emissions less than 0.3 g/km has changed
	Subtotal		1	

Q	Marking instructions	AO	Marks	Typical solution
19(b)	<p>States one of the following reasons</p> <ol style="list-style-type: none"> no diesel cars in the LDS have CO emissions more than 0.5 g/km Values of CO emissions for some diesel cars are missing from LDS LDS data is not representative due to only few regions in England or some makes of cars or only two years 	2.4	E1	<p>No diesel cars in the LDS have CO emissions more than 0.5 g/km</p> <p>The LDS only uses data from cars in some regions in England but not all</p>
	<p>States a different reason</p> <ol style="list-style-type: none"> no diesel cars in the LDS have CO emissions more than 0.5 g/km Values of CO emissions for some diesel cars are missing from LDS LDS data is not representative due to only few regions in England or some makes of cars or only two years 	2.4	E1	
	Subtotal		2	

	Question 19 Total		9	
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