Question Number	Scheme	Marks
4(a)(i)	$H_0 : p = 0.35 \quad H_1 : p \neq 0.35$	B1
(ii)	B(15,0.35)	M1
	CR $X \leq 1 \cup X \geq 10$	A1A1
		(4)
(b)	8 is not in CR/Do not reject H_0/Not significant	M1
	There is evidence that the Company's **claim** is true	A1ft
		(2)
(c)	0.0142 + 0.0124 = 0.0266	B1
		(1)

	Notes	Total 7
(a)(i)	**B1**	Both hypotheses correct. Must be attached to H_0 and H_1. Must be in terms of p or π Allow seen in (ii) if no answer given in (i)
(ii)	**M1**	Writing or using B(15,0.35) May be seen in (i) May be implied by e.g. P($X \leqslant 1$) = 0.0142 or P($X \leqslant 9$) = 0.9876 or $X \leq 1$ **and** $X \geq 10$ oe
	A1	$X \leq 1$ (Allow any letter) (accept $X < 2$) Allow $0 \leqslant X \leqslant 1$ but P($X \leqslant 1$) is A0
	A1	$X \geq 10$ (Allow any letter) (accept $X > 9$) Allow $10 \leqslant X \leqslant 15$ but P($X \geqslant 10$) is A0
(b)	**M1**	For a non contextual statement that matches their CR. If they write their CR as P($X \geqslant 10$) take this to mean $X \geqslant 10$ Allow calculation of P($X \geqslant 8$) = 0.1132 or P($X \leqslant 8$) = 0.9578 and not significant/do not reject H_0 Do not allow contradictory non contextual statements e.g.8 is not in the CR so significant This may be implied by a correct contextual statement on its own
	A1ft	For a correct contextual conclusion for their CR. Must mention claim or peas and germinate e.g. there is evidence that 35% (oe) of **peas germinate**
(c)	**B1**	For 0.0266 or awrt 0.0266 (cal gives 0.02662196…) May be seen in part (b)

5. A string of length 40 cm is cut into 2 pieces at a random point.
The continuous random variable L represents the length of the longer piece of string.

(a) Write down the distribution of L

(2)

(b) Find the probability that the length of the longer piece of string is 28 cm to the nearest cm.

(2)

Each piece of string is used to form the perimeter of a square.

(c) Calculate the probability that the area of the larger square is less than $64\,\text{cm}^2$

(3)

(d) Calculate the probability that the difference in area between the two squares is greater than $81\,\text{cm}^2$

(4)

(Total for Question 5 is 11 marks)