Qu	Scheme	Mark	AO
2. (a)	[D = number of bags that are damp] $D \sim B(35, 0.08)$ NB $0.08 = \frac{2}{25}$	M1	3.3
(i)	$P(D = 2) = 0.2430497\ldots$ awrt **0.243**	A1	3.4
(ii)	$P(D > 3) = [1 - P(D \leqslant 3) = 1 - 0.69397...] = 0.30602\ldots$ awrt **0.306**	A1	1.1b
		(3)	
(b)	$H_0 : p = 0.08$ $H_1 : p < 0.08$	B1	2.5
	[$X \sim$] B(70, 0.08)	M1	2.1
	$[P(X \leqslant 2)] = 0.0739756\ldots$ awrt **0.074**	A1	1.1b
	[0.074 < 0.10 so significant, reject H_0 so…]		
	there is evidence to support supplier *B*'s claim (o.e.)	A1	2.2b
		(4)	
		(7 marks)	

Notes

(a) M1 for selecting a correct model: sight of or use of B(35, 0.08) [Condone B(0.08, 35)]
May be implied by one correct answer or sight of $P(D \leqslant 3)$ = awrt 0.694 (or allow 0.693)

or seeing $\binom{35}{2} 0.08^2 \times (1 - 0.08)^{35-2}$

Saying B(35, 8%) without a correct calculation would score M0

(i) 1st A1 for awrt 0.243

(ii) 2nd A1 for awrt 0.306 (Condone poor use of notation e.g. $P(D = 3) = 0.306\ldots$ i.e. just mark ans)

NB $P(D \ldots 3) = 0.539$ scores 2nd A0 but would of course score M1

(b) B1 for both hypotheses correct in terms of p or π [Condone 8% for 0.08]

M1 for sight or correct use of B(70, 0.08) [Condone B(0.08, 70)]
May be implied by prob of 0.074 or better

1st A1 for final answer awrt 0.074 can condone poor notation e.g. $P(X = 2)$ = awrt 0.074
Can allow this mark for CR of $X \leqslant 2$ provided $[P(X \leqslant 2)] = 0.074$ (or better) is seen
[Can allow 0.07 if $X \sim B(70, 0.08)$ and $P(X \leqslant 2)$ are both seen]

2nd A1 (**dep on** M1A1 but independent of hypotheses) for a correct inference in context
Must mention claim or *B* **and** idea of support for …
or proportion/probability (of damp bags) **and** idea of less than 8% or *A*
2nd A0 for contradictory statements e.g. "accept H_0 so evidence to support *B*'s claim"
2nd A0 if you see $0.0739\ldots < 0.08$ so significant/ reject H_0 etc

MR **0.8 for 0.08**
In (a) allow M1 for B(35, 0.8) then A0A0
In (b) allow B1 for Hypotheses and M1 for B(70, 0.8) seen, then A0A0