Question	Scheme	Marks
4. (a)	$[P(Y = 0) < 0.05]$	
	$(1 - 0.07)^n < 0.05$	M1
	$n \log (0.93) < \log (0.05)$	M1
	$n > 41.28\ldots.$ $n = 42$	A1
		(3)
(b)	H_0: $p = 0.08$ H_1: $p \neq 0.08$	B1
	$X \sim B(75, 0.08) \rightarrow Po(6)$	M1
	$P(X \ldots 11) = 1 - P(X \text{„} 10)$	M1
	$= 1 - 0.9574 = 0.0426$ [> 0.025]	A1
	Do not Reject H_0 or not significant or 11 does not lie in the CR	dM1
	There is not significant evidence to suggest that the **proportion** of pears weighing more than 180g has **changed**	A1
		(6)
		[9 marks]
	Notes	
(a)	1st M1 For 0.93^n or 0.93^{42} or 0.93^{41}	
	2nd M1 for $n \log (0.93) < \log (0.05)$ or $\log_{0.93} 0.05$„ n Allow = or „ condone > or … or $0.93^{42} = 0.0474...$ or 0.0475 (min 4 dp) Implied by 41.28… or awrt 41.3	
	A1 42 cao **NB** An answer of 42 gains 3/3	
	SC condone for M1 M0 A0 $\left([e^{-3} =]0.04978...\text{ (min 4dp) } \textbf{and } -0.07n = -3\right)$	
(b)	B1 both hypotheses correct (may use p or π but do not allow p(x)) Allow 8% connected to H_0 and H_1 correctly	
	1st M1 writing or using Poisson approximation with mean 6.	
	2nd M1 for writing or using $1 - P(X \text{„} 10)$ or for a CR method (must give a CR) giving $P(X \text{„} 11) = 0.9799$ or $P(X \ldots 12) = 0.0201$ Implied by awrt 0.0426 or correct CR	
	1st A1 for 0.0426 or CR: $X \ldots 12$ ignore lower CR. NB M1A1 for $P(X \text{„} 10) = 0.9574$ on its own	
	3rd dM1 Independent of their hypotheses dependent on 2nd M1 but A correct statement i.e. not significant/do not reject H_0/Not in CR/reject H_1 Do not allow non-contextual conflicting statements.	
	2nd A1 For a correct contextual statement. Need proportion oe and changed oe Allow the farmers **belief** (oe) is not supported (bold words) Do not accept contradicting statements. No hypotheses is A0	
	NB Award d M1A1 for a correct contextual statement on its own	
	SC1: Use of one-tailed test may score B0M1M1A1M1A0 for rejecting H_0	
	SC2: Use of Binomial throughout max (3/6) B1M0M1A0dM1A0	
	SC3: normal approximation prob = 0.0277 (maximum 3 out of 6) B1 M0 M1 for writing or using $1 - P(X \text{„} 10.5)$ allow < implied by awrt 0.027/0.028 A0 dM1A0	