Question Number	Scheme	Marks
4 (a)	$\frac{273}{150\times10}=0.18$	M1 A1
		(2)
(b)	${}^{10}C_5\times0.18^5\times0.82^5\times150[=2.65]$ *	B1*
		(1)
(c)	0.54	B1
		(1)
(d)	To ensure that no expected frequency < 5	B1
		(1)
(e)	H_0 : Binomial distribution is a good fit. H_1 : Binomial distribution is not a good fit	B1
	Combine cells 8 + 6 + 3 = 17 and 10.05 + 2.65 + '0.54' = 13.24	M1
	$\sum\frac{(O_i-E_i)^2}{E_i}=2.51+\frac{(17-13.24)^2}{13.24}$	M1
	= 3.5777 awrt 3.58	A1
	$\nu=5-1-1=3$	B1
	$\chi^2_3(0.05)=6.251$	B1ft
	[Do not reject H_0/not significant] Binomial distribution is a suitable model	dA1
		(7)

	Notes		Total 12
(a)	**M1**	for a correct method to find the value of *p*	
	A1	Awrt 0.18	
(b)	**B1***	for a correct expression for *r*	
(c)	**B1**	for 0.54	
(d)	**B1**	for a correct explanation	
(e)	**B1**	for both hypotheses correct (any mention of B(10, *p*) is B0)	
	M1	for combining cells	
	M1	Dep on an attempt to combine cells. Use of 2.51 + $\sum\frac{(O_i-E_i)^2}{E_i}$ for remaining cells	
	A1	awrt 3.58	
	B1	$\nu=3$	
	B1ft	6.251 or better. Allow ft from their stated DoF	
	dA1	dependent on 2nd M1. For a correct conclusion which states that the data are consistent with a binomial distribution which must be consistent with the test statistic and CV (Condone any mention of *n* and *p* or it supports the managers belief)	