Question Number	Scheme	Marks
4. (a)	$\frac{[0\times 24]+1\times 34+2\times 28+3\times 21+4\times 8+5\times 5}{120}\left[=1.75\right]$*	B1*cso (1)
(b)	$\left[s=\right]120\times\frac{\mathrm{e}^{-1.75}1.75^{4}}{4!}$ [= 8.15] * or $\left[s=\right]120-\left(20.85+36.49+31.93+120\times\frac{\mathrm{e}^{-1.75}1.75^{3}}{3!}+3.95\right)$[= 8.15] *	B1*cso (1)
(c)	$\left[r=\right]18.63$	B1 (1)
(d)	H_0 : Poisson distribution is a good fit. H_1 : Poisson distribution is not a good fit $\sum\frac{(O_i-E_i)^2}{E_i}=1.43+\frac{(8+5-(8.15+3.95))^2}{8.15+3.95}$ = 1.49694… awrt 1.5(0) $\nu=5-1-1=3$ $\chi^2_3(0.05)=7.815$ [Do not reject H_0/not significant] There is insufficient evidence to reject the office manager's belief or the number of jobs sent to the printer are consistent with a Poisson distribution.	B1 M1 M1 A1 B1 B1ft A1 (7)
		[10]

	Notes
(a)	B1cso correct calculation, minimum working $\frac{34+56+63+32+25}{120}=1.75$*
(b)	B1cso fully correct calculation (may be seen in stages) leading to 8.15*
(c)	For 18.63 (This may be seen in part (b) if labelled as *r*)
(d)	1st B1 both hypotheses correct (mention of 1.75 is B0) 1st M1 evidence of combining last 2 cells e.g. 8 + 5 and 8.15 + 3.95 2nd M1 use of 1.43 + $\sum\frac{(O_i-E_i)^2}{E_i}$ for remaining cells (Condone cells not combined. May be implied by 1.43 + 0.00276…+ 0.279… or awrt 1.71) 1st A1 awrt 1.50 (allow 1.5 from correct working) 2nd B1 Dof/ $\nu=3$ implied by a correct critical value of 7.815 3rd B1ft 7.815 (allow ft on the ν so may see 9.488 or 11.070 etc) 2nd A1 (dep on 2nd M1) a correct conclusion which states that the office manager's belief is correct/the data are consistent with a Poisson distribution which must be consistent with the test statistic and CV. Condone Po(1.75) is a suitable model. This mark is independent of the hypotheses