| Question Number | Scheme | | Marks |
|---|---|---|---|
| 7(a) | | | |
| | $\frac{e^{-2.8}(2.8)^5}{5!}n = n - 87.63$ [$n$ = 96] | | M1 |
| | Observed 5 and Expected awrt 8.37… | | A1 |
| | | | (2) |
| (b) | $H_0$: Poisson(2.8) is a suitable model/ good fit<br>$H_1$: Poisson(2.8) is not a suitable model/ good fit | | B1 |
| | $\chi^2 = \sum \frac{(O-E)^2}{E} = \frac{("5"-"8.37")^2}{8.37} + \frac{(3-6.25)^2}{6.25} + 9.86$ | | M1 M1 |
| | = awrt **<u>12.9</u>** | | A1 |
| | Degrees of freedom = 6<br>$\chi^2_{6,0.05} = 12.592$ | | M1<br>A1ft |
| | [Reject $H_0$] Data is not consistent with random sampling from a Poisson (2.8) model. | | A1cso |
| | | | (7) |

**Notes**

| | | |
|---|---|---|
| (a) | **M1** | Setting up an equation leading to a value for $n$. eg $5.84 = e^{-2.8} \times n$ May be implied by correct observed and expected (2dp) . |
| | **A1** | 5 and awrt 8.37 |
| (b) | **B1** | Both hypotheses correct must mention Po(2.8) at least once |
| | **M1** | For combining last 2 cells to get observed 3 and expected 6.25 or $\frac{(3-6.25)^2}{6.25}$ seen. |
| | **M1** | For $\frac{("5"-"8.37")^2}{8.37} + 9.86 + ...$ or a fully correct calculation |
| | **A1** | awrt 12.9 (this is dependent upon M1M1) |
| | **M1** | Using df for their (number of expected values used – 1) |
| | **A1ft** | 12.592 (ft 14.067 from df = 7) |
| | **A1cso** | Jeff's model/Poisson is not suitable (condone missing 2.8 here) all marks must have been scored. |