The number of accidents, x, that occur each day on a motorway are recorded over a period of 40 days. The results are shown in the following table.

Number of accidents	0	1	2	3	4	5	6	$\geqslant 7$
Observed frequency	3	5	8	10	5	7	2	0

(i) Show that the mean number of accidents each day is 2.95 and calculate the variance for this sample. Explain why these values suggest that a Poisson distribution might fit the data. [3]

A Poisson distribution with mean 2.95, as found from the data, is used to calculate the expected frequencies, correct to 2 decimal places. The results are shown in the following table.

Number of accidents	0	1	2	3	4	5	6	$\geqslant 7$
Observed frequency	3	5	8	10	5	7	2	0
Expected frequency	2.09	6.18	9.11	8.96	6.61	3.90	1.92	1.23

(ii) Show how the expected frequency of 6.61 for $x = 4$ is obtained. [2]

(iii) Test at the 5% significance level the goodness of fit of this Poisson distribution to the data. [7]