4. It is suggested that the delay, in hours, of certain flights from a particular country may be modelled by the continuous random variable, T, with probability density function

$$f(t) = \begin{cases} \frac{2}{25}t & 0 \leqslant t < 5 \\ 0 & \text{otherwise} \end{cases}$$

(a) Show that for $0 \leqslant a \leqslant 4$

$$P(a \leqslant T < a + 1) = \frac{1}{25}(2a + 1)$$

(3)

A random sample of 150 of these flights is taken. The delays are summarised in the table below.

Delay (t hours)	**Frequency**
$0 \leqslant t < 1$	10
$1 \leqslant t < 2$	13
$2 \leqslant t < 3$	24
$3 \leqslant t < 4$	35
$4 \leqslant t < 5$	68

(b) Test, at the 5% significance level, whether the given probability density function is a suitable model for these delays.
You should state your hypotheses, expected frequencies, test statistic and the critical value used.

(8)

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Question 4 continued

(Total for Question 4 is 11 marks)