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1. *Flogcar* is a car hire company that only allows cars to be hired for single days. The numbers of cars hired on different days are statistically independent. The number of cars hired on a randomly selected day from *Flogcar* is modelled by a Poisson distribution with mean 4

(a) Calculate the probability that exactly 6 cars are hired from *Flogcar* on a randomly selected day.

(2)

(b) Calculate the probability that on 2 randomly selected days, the total number of cars hired from *Flogcar* is between 3 and 7 inclusive.

(3)

(c) Use a suitable approximation to find the probability that on 7 randomly selected days, the total number of cars hired from *Flogcar* is more than 30

(5)

The probability that a car hired from *Flogcar* is returned in good condition is 0.97

In a randomly chosen period, *Flogcar* hires out 100 cars.

(d) (i) Explain why the distribution of the number of cars returned in good condition would not be well approximated by the Poisson distribution.

(1)

(ii) By considering the number of cars hired out that are **not** returned in good condition, use a Poisson approximation to estimate the probability that more than 95 of the cars hired out in this period are returned in good condition. Show your working clearly.

(3)

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Question 1 continued

(Total 14 marks)

Q1