7. Members of a conservation group record the number of sightings of a rare animal. The number of sightings follows a Poisson distribution with a rate of 1 every 2 months.

(a) Find the smallest value of n such that the probability that there are at least n sightings in 2 months is less than 0.05

(2)

(b) Find the smallest number of months, m, such that the probability of no sightings in m months is less than 0.05

(2)

(c) Find the probability that there is at least 1 sighting per month in each of 3 consecutive months.

(3)

(d) Find the probability that the number of sightings in an 8 month period is equal to the expected number of sightings for that period.

(2)

(e) Given that there were 4 sightings in a 4 month period, find the probability that there were more sightings in the last 2 months than in the first 2 months.

(3)

(Total for Question 7 is 12 marks)

TOTAL FOR PAPER IS 75 MARK