3. A hospital wants to carry out a sample survey to obtain patients' opinions about their stay at the hospital.

(a) Suggest a suitable sampling frame for the survey.

(1)

(b) Identify the sampling units.

(1)

(c) Give one advantage **and** one disadvantage of taking a sample survey rather than a census.

(2)

It is known that on average 3 in every 1000 births at this hospital result in identical twins being born. When twins are born this is counted as one birth.

Last year there were 3000 births at this hospital.

(d) Using a Poisson approximation, find the probability that at this hospital last year there were

(i) less than 4 births resulting in identical twins,

(ii) more than 7 but at most 10 births resulting in identical twins.

(4)

(e) Explain why the Poisson approximation in part (d) is suitable.

(1)

(Total for Question 3 is 9 marks)