Question 2 (7 marks)

The 'shelf life' of a product is the recommended maximum time for which the product can be stored before becoming unfit for use, consumption, or sale.

When stored in the refrigerator, eggs have a shelf life that is normally distributed, with a mean of 24.5 days and a standard deviation of 2.8 days.

When stored in a cool place, bread has a shelf life that is normally distributed, with a mean of 2.4 days and a standard deviation of 0.8 days.

(a) Let E be the distribution of the shelf life of a randomly selected egg and B be the distribution of the shelf life of a randomly selected loaf of bread. The distribution of E is shown below.

On the axis provided below, sketch the distribution of B.

Shelf life (days)

(2 marks)

(b) What is the probability that a randomly selected egg will have a shelf life of 3 weeks or less?

(1 mark)

(c) Ten per cent of eggs have a shelf life of k days or greater.

Find k.

(1 mark)

(d) A person is considering consuming a 36-day-old egg and some 5-day-old bread.

Assume that the egg and the bread have been stored appropriately and have been randomly selected.

Which *one* of these two products is more likely to be unfit for consumption? Support your answer with calculations.

(3 marks)