4 A bag contains 50 counters, each with one of the numbers 4, 7 or 10 written on it in the ratio 2 : 3 : 5 respectively.

A random sample of 2 counters is taken from the bag. The numbers on the 2 counters are recorded as D_1 and D_2

The random variable M represents the mean of D_1 and D_2

(a) Show that $\mathrm{P}(M = 4) = \dfrac{9}{245}$

(1)

(b) Find the sampling distribution of M

(6)

A random sample of n sets of 2 counters is taken. The random variable T represents the number of these n sets of 2 counters that have a mean of 4

Given that each set of 2 counters is replaced after it is drawn,

(c) calculate the minimum value of n such that $\mathrm{P}(T = 0) < 0.15$

(3)

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Question 4 continued

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Question 4 continued

(Total for Question 4 is 10 marks)