7 **(a)** How many different arrangements are there of the 10 letters in the word SEYCHELLES? [1]

(b) How many different arrangements are there of the 10 letters in the word SEYCHELLES in which there are exactly two letters between the Ss and one of these two letters is C? [3]

(c) How many different arrangements are there of the 10 letters in the word SEYCHELLES in which there is an S at the beginning, an S at the end and the three Es are **not** all next to each other? [3]

5 letters are selected at random from the 10 letters in the word SEYCHELLES.

(d) Find the probability that these 5 letters include the three Es. [3]

Additional page

If you use the following page to complete the answer to any question, the question number must be clearly shown.

7 **(a)** Find the number of different arrangements of the 10 letters in the word ZOOLOGICAL in which the three Os are together and the two Ls are **not** next to each other. [4]

(b) Find the number of different arrangements of the 10 letters in the word ZOOLOGICAL in which there are exactly 5 letters between the two Ls. [3]

Two letters are chosen at random from the 10 letters in the word ZOOLOGICAL.

(c) Find the probability that these two letters are different. [3]

Additional page

If you use the following page to complete the answer to any question, the question number must be clearly shown.

2 **(a)** Find the number of different arrangements of the 8 letters in the word KANGAROO in which the two As are together and the two Os are **not** together. [3]

A fair 8-sided dice has faces labelled K, A, N, G, A, R, O, O. The dice is rolled repeatedly.

(b) Find the probability that fewer than 6 rolls of this dice are required to obtain an A. [2]

(c) Find the probability that the second A is obtained on the 6th roll of the dice. [2]

5 In a group of 20 musicians, there are 9 guitarists, 6 pianists and 5 drummers.

6 musicians are selected from these 20 to perform at a concert.

(a) Find the number of different ways in which the 6 musicians can be selected if there must be at least 3 guitarists, at most 2 pianists and exactly 1 drummer. [4]

Three bands will be selected from the original group of 20 musicians. Each band will consist of 3 guitarists, 1 pianist and 1 drummer. No musician can be in more than one band. The first band selected will play at a concert in France, the second band selected will play in Italy and the third band selected will play in Spain.

(b) Find the number of different ways in which these three bands can be selected. [3]