Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

4913308332

MATHEMATICS **9709/62**

Paper 6 Probability & Statistics 1 **(S1)** **February/March 2017**

1 hour 15 minutes

Candidates answer on the Question Paper.

Additional Materials: List of Formulae (MF9)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces at the top of this page.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** the questions.
Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place in the case of angles in degrees, unless a different level of accuracy is specified in the question.
The use of an electronic calculator is expected, where appropriate.
You are reminded of the need for clear presentation in your answers.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this paper is 50.

This document consists of **11** printed pages and **1** blank page.

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1 Twelve values of x are shown below.

1761.6	1758.5	1762.3	1761.4	1759.4	1759.1
1762.5	1761.9	1762.4	1761.9	1762.8	1761.0

Find the mean and standard deviation of $(x - 1760)$. Hence find the mean and standard deviation of x. [4]

2 A bag contains 10 pink balloons, 9 yellow balloons, 12 green balloons and 9 white balloons. 7 balloons are selected at random without replacement. Find the probability that exactly 3 of them are green. [3]

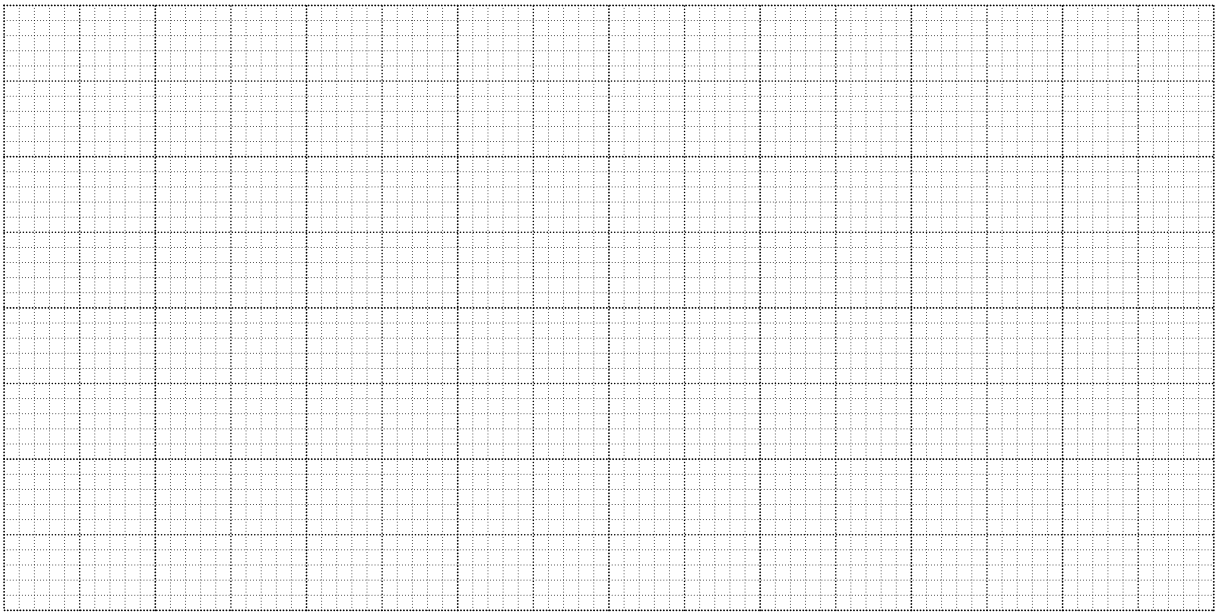
3 It is found that 10% of the population enjoy watching Historical Drama on television. Use an appropriate approximation to find the probability that, out of 160 people chosen randomly, more than 17 people enjoy watching Historical Drama on television. [5]

4 The weights in kilograms of packets of cereal were noted correct to 4 significant figures. The following stem-and-leaf diagram shows the data.

747	3	(1)
748	1 2 5 7 7 9	(6)
749	0 2 2 2 3 5 5 5 6 7 8 9	(12)
750	1 1 2 2 2 3 4 4 5 6 7 7 8 8 9	(15)
751	0 0 2 3 3 4 4 4 5 5 7 7 9	(13)
752	0 0 0 1 1 2 2 3 4 4 4	(11)
753	2	(1)

Key: 748 | 5 represents 0.7485 kg.

(i) On the grid, draw a box-and-whisker plot to represent the data. [5]



(ii) Name a distribution that might be a suitable model for the weights of this type of cereal packet. Justify your answer. [2]

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5 **(i)** A plate of cakes holds 12 different cakes. Find the number of ways these cakes can be shared between Alex and James if each receives an odd number of cakes. [3]

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(ii) Another plate holds 7 cup cakes, each with a different colour icing, and 4 brownies, each of a different size. Find the number of different ways these 11 cakes can be arranged in a row if no brownie is next to another brownie. [3]

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(iii) A plate of biscuits holds 4 identical chocolate biscuits, 6 identical shortbread biscuits and 2 identical gingerbread biscuits. These biscuits are all placed in a row. Find how many different arrangements are possible if the chocolate biscuits are all kept together. [3]

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6 Pack A consists of ten cards numbered 0, 0, 1, 1, 1, 1, 1, 3, 3, 3. Pack B consists of six cards numbered 0, 0, 2, 2, 2, 2. One card is chosen at random from each pack. The random variable X is defined as the sum of the two numbers on the cards.

(i) Show that $\mathrm{P}(X = 2) = \frac{2}{15}$. [2]

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(ii) Draw up the probability distribution table for X. [4]

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(iii) Given that $X = 3$, find the probability that the card chosen from pack A is a 1. [3]

7 **(a)** The lengths, in centimetres, of middle fingers of women in Raneland have a normal distribution with mean μ and standard deviation σ. It is found that 25% of these women have fingers longer than 8.8 cm and 17.5% have fingers shorter than 7.7 cm.

(i) Find the values of μ and σ. [5]

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The lengths, in centimetres, of middle fingers of women in Snoland have a normal distribution with mean 7.9 and standard deviation 0.44. A random sample of 5 women from Snoland is chosen.

(ii) Find the probability that exactly 3 of these women have middle fingers shorter than 8.2 cm. [5]

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(b) The random variable X has a normal distribution with mean equal to the standard deviation. Find the probability that a particular value of X is less than 1.5 times the mean. [3]

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