

Please check the examination details below before entering your candidate information

Candidate surname

Other names

**Pearson Edexcel**  
**International**  
**Advanced Level**

Centre Number

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Candidate Number

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**Time** 1 hour 30 minutes

**Paper**  
**reference**

**WST01/01**

**Mathematics**

**International Advanced Subsidiary/Advanced Level**  
**Statistics S1**

**You must have:**

Mathematical Formulae and Statistical Tables (Yellow), calculator

Total Marks

**Candidates may use any calculator permitted by Pearson regulations. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulae stored in them.**

### Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions and ensure that your answers to parts of questions are clearly labelled.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- You should show sufficient working to make your methods clear. Answers without working may not gain full credit.
- Values from the statistical tables should be quoted in full. If a calculator is used instead of the tables, the value should be given to an equivalent degree of accuracy.
- Inexact answers should be given to three significant figures unless otherwise stated.

### Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- There are 6 questions in this question paper. The total mark for this paper is 75.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.
- If you change your mind about an answer, cross it out and put your new answer and any working underneath.
- Good luck with your examination.

Turn over ►

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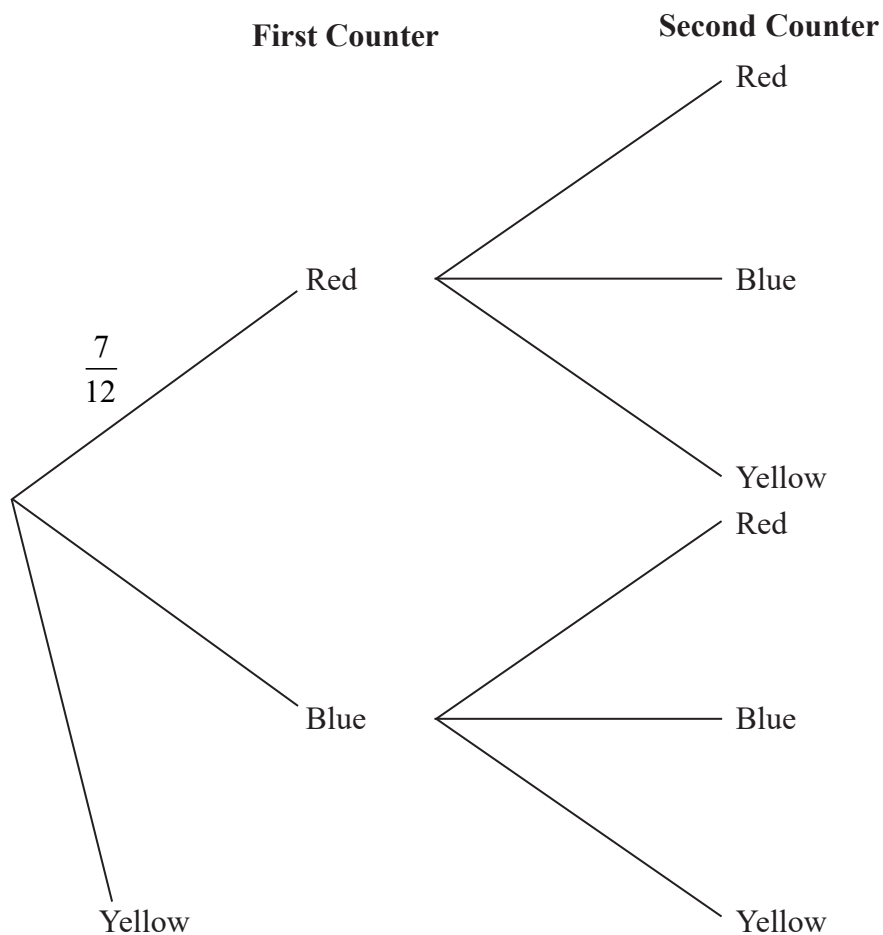
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Pearson

1. There are 7 red counters, 3 blue counters and 2 yellow counters in a bag. Gina selects a counter at random from the bag and keeps it. If the counter is yellow she does not select any more counters. If the counter is not yellow she randomly selects a second counter from the bag.

(a) Complete the tree diagram.



(2)

Given that Gina has selected a yellow counter,

(b) find the probability that she has 2 counters.

(3)

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Question 1 continued

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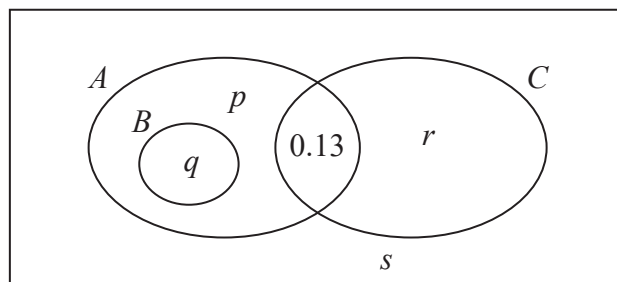
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Q1

(Total 5 marks)



- The events  $A$  and  $C$  are independent and  $P(A) = 0.65$



- (a) State which two of the events  $A$ ,  $B$  and  $C$  are mutually exclusive. (1)
- (b) Find the value of  $r$  and the value of  $s$ . (5)

The events  $(A \cap C')$  and  $(B \cup C)$  are also independent.

- (c) Find the exact value of  $p$  and the exact value of  $q$ . Give your answers as fractions. (6)

Question 2 continued

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Q2

(Total 12 marks)



3. A random sample of 100 carrots is taken from a farm and their lengths,  $L$  cm, recorded. The data are summarised in the following table.

Length, $L$ cm	Frequency, $f$	Class mid point, $x$ cm
$5 \leq L < 8$	5	6.5
$8 \leq L < 10$	13	9
$10 \leq L < 12$	16	11
$12 \leq L < 15$	25	13.5
$15 \leq L < 20$	30	17.5
$20 \leq L < 28$	11	24

A histogram is drawn to represent these data.

The bar representing the class  $5 \leq L < 8$  is 1.5 cm wide and 1 cm high.

- (a) Find the width and height of the bar representing the class  $15 \leq L < 20$  (3)

- (b) Use linear interpolation to estimate the median length of these carrots. (2)

- (c) Estimate
- (i) the mean length of these carrots, (2)
- (ii) the standard deviation of the lengths of these carrots. (3)

A supermarket will only buy carrots with length between 9 cm and 22 cm.

- (d) Estimate the proportion of carrots from the farm that the supermarket will buy. (2)

Any carrots that the supermarket does not buy are sold as animal feed.

The farm makes a profit of 2.2 pence on each carrot sold to the supermarket, a profit of 0.8 pence on each carrot longer than 22 cm and a loss of 1.2 pence on each carrot shorter than 9 cm.

- (e) Find an estimate of the mean profit per carrot made by the farm. (2)

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Question 3 continued

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Question 3 continued

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Lined area for writing the answer to Question 3.

Q3

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(Total 14 marks)



- (d) Find the probability that there is one letter in each of the 3 categories. (3)

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Question 4 continued

Handwriting practice area with 30 horizontal lines.

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Question 4 continued

Lined area for writing the answer to Question 4.



Question 4 continued

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Lined area for writing the answer to Question 4.

(Total 13 marks)

Q4





Question 5 continued

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Question 5 continued

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Question 5 continued

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Q5

(Total 15 marks)



6. Two economics students, Andi and Behrouz, are studying some data relating to unemployment,  $x\%$ , and increase in wages,  $y\%$ , for a European country. The least squares regression line of  $y$  on  $x$  has equation

$$y = 3.684 - 0.3242x$$

and  $\sum y = 23.7$      $\sum y^2 = 42.63$      $\sum x^2 = 756.81$      $n = 16$

- (a) Show that  $S_{yy} = 7.524375$  (1)

- (b) Find  $S_{xx}$  (4)

- (c) Find the product moment correlation coefficient between  $x$  and  $y$ . (3)

Behrouz claims that, assuming the model is valid, the data show that when unemployment is 2% wages increase at over 3%

- (d) Explain how Behrouz could have come to this conclusion. (1)

Andi uses the formula

$$\text{range} = \text{mean} \pm 3 \times \text{standard deviation}$$

to estimate the range of values for  $x$ .

- (e) Find estimates of the minimum value and the maximum value of  $x$  in these data using Andi's formula. (3)

- (f) Comment, giving a reason, on the reliability of Behrouz's claim. (2)

Andi suggests using the regression line with equation  $y = 3.684 - 0.3242x$  to estimate unemployment when wages are increasing at 2%

- (g) Comment, giving a reason, on Andi's suggestion. (2)

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Question 6 continued

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Question 6 continued

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Q6

Grading box for Question 6.

(Total 16 marks)

TOTAL FOR PAPER: 75 MARKS

END

