

Centre No.						Paper Reference					Surname	Initial(s)	
Candidate No.					6	6	8	3	/	0	1	Signature	

Paper Reference(s)

6683/01

Edexcel GCE

Statistics S1

Advanced/Advanced Subsidiary

Tuesday 5 June 2007 – Afternoon

Time: 1 hour 30 minutes

Examiner's use only

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Team Leader's use only

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Question Number	Leave Blank
1	
2	
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4	
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6	
7	
Total	

<u>Materials required for examination</u>	<u>Items included with question papers</u>
Mathematical Formulae (Green)	Nil

Candidates may use any calculator allowed by the regulations of the Joint Council for Qualifications. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulas stored in them.

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature. Check that you have the correct question paper.
 Answer ALL the questions.
 You must write your answer for each question in the space following the question.
 Values from the statistical tables should be quoted in full. When a calculator is used, the answer should be given to an appropriate degree of accuracy.

Information for Candidates

A booklet 'Mathematical Formulae and Statistical Tables' is provided.
 Full marks may be obtained for answers to ALL questions.
 The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2).
 There are 7 questions in this question paper. The total mark for this paper is 75.
 There are 24 pages in this question paper. Any blank pages are indicated.

Advice to Candidates

You must ensure that your answers to parts of questions are clearly labelled.
 You should show sufficient working to make your methods clear to the Examiner.
 Answers without working may not gain full credit.

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- 1. A young family were looking for a new 3 bedroom semi-detached house. A local survey recorded the price x , in £1000, and the distance y , in miles, from the station of such houses. The following summary statistics were provided

$$S_{xx} = 113\ 573, \quad S_{yy} = 8.657, \quad S_{xy} = -808.917$$

- (a) Use these values to calculate the product moment correlation coefficient. (2)

- (b) Give an interpretation of your answer to part (a). (1)

Another family asked for the distances to be measured in km rather than miles.

- (c) State the value of the product moment correlation coefficient in this case. (1)



2. The box plot in Figure 1 shows a summary of the weights of the luggage, in kg, for each musician in an orchestra on an overseas tour.

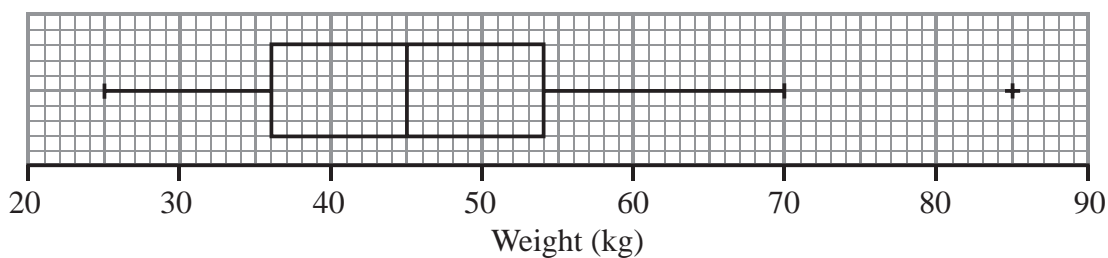


Figure 1

The airline’s recommended weight limit for each musician’s luggage was 45 kg. Given that none of the musicians’ luggage weighed exactly 45 kg,

- (a) state the proportion of the musicians whose luggage was below the recommended weight limit.

(1)

A quarter of the musicians had to pay a charge for taking heavy luggage.

- (b) State the smallest weight for which the charge was made.

(1)

- (c) Explain what you understand by the + on the box plot in Figure 1, and suggest an instrument that the owner of this luggage might play.

(2)



3. A student is investigating the relationship between the price (y pence) of 100g of chocolate and the percentage ($x\%$) of cocoa solids in the chocolate. The following data is obtained

Chocolate brand	A	B	C	D	E	F	G	H
x (% cocoa)	10	20	30	35	40	50	60	70
y (pence)	35	55	40	100	60	90	110	130

(You may use: $\sum x = 315$, $\sum x^2 = 15\,225$, $\sum y = 620$, $\sum y^2 = 56\,550$, $\sum xy = 28\,750$)

- (a) On the graph paper on page 9 draw a scatter diagram to represent these data. (2)
- (b) Show that $S_{xy} = 4337.5$ and find S_{xx} . (3)

The student believes that a linear relationship of the form $y = a + bx$ could be used to describe these data.

- (c) Use linear regression to find the value of a and the value of b , giving your answers to 1 decimal place. (4)
- (d) Draw the regression line on your scatter diagram. (2)

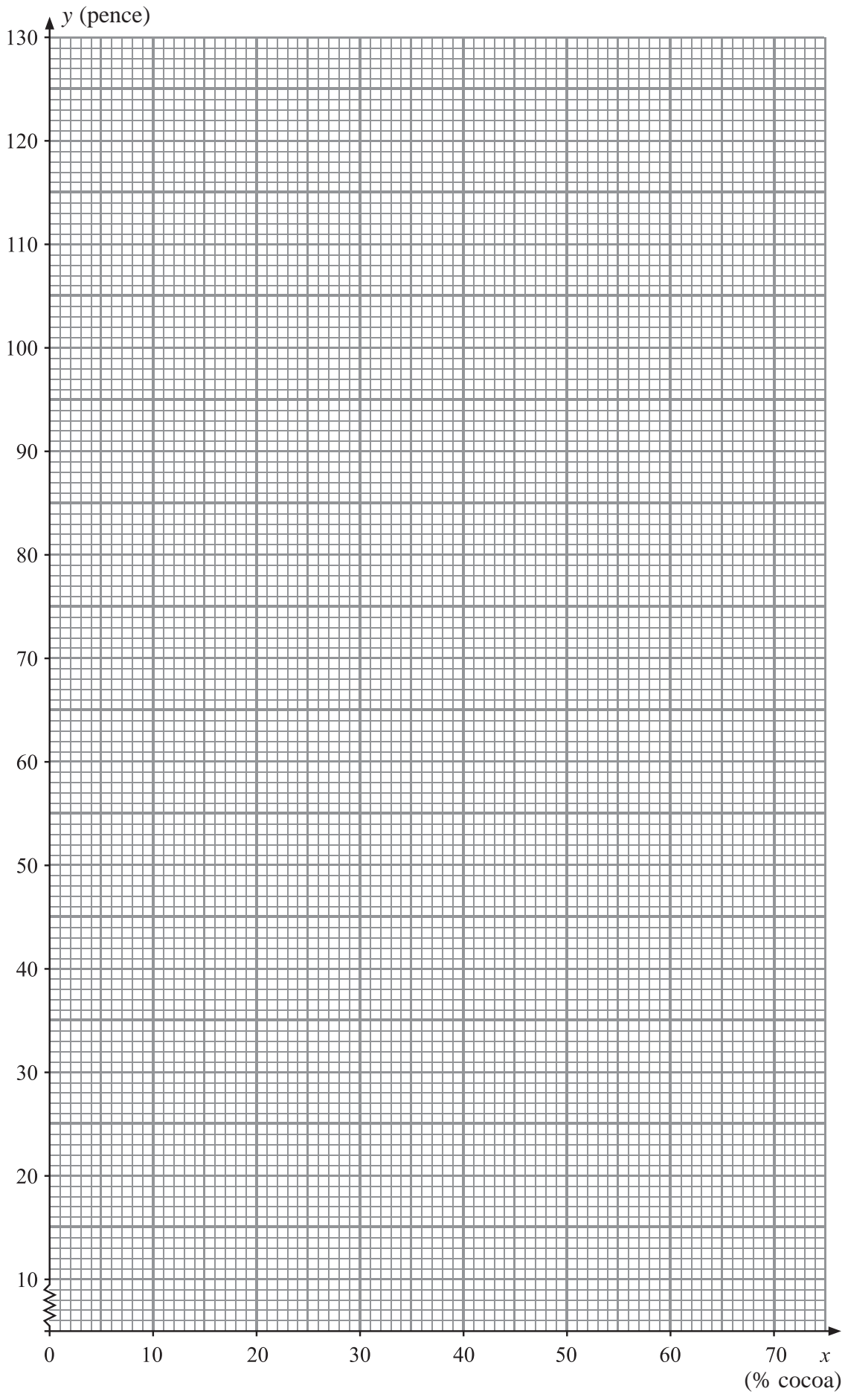
The student believes that one brand of chocolate is overpriced.

- (e) Use the scatter diagram to
- (i) state which brand is overpriced,
 - (ii) suggest a fair price for this brand.
- Give reasons for both your answers. (4)



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Question 3 continued



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4. A survey of the reading habits of some students revealed that, on a regular basis, 25% read quality newspapers, 45% read tabloid newspapers and 40% do not read newspapers at all.

(a) Find the proportion of students who read both quality and tabloid newspapers. **(3)**

(b) In the space on page 13 draw a Venn diagram to represent this information. **(3)**

A student is selected at random. Given that this student reads newspapers on a regular basis,

(c) find the probability that this student only reads quality newspapers. **(3)**



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Question 4 continued

(Total 9 marks)

Q4



5.

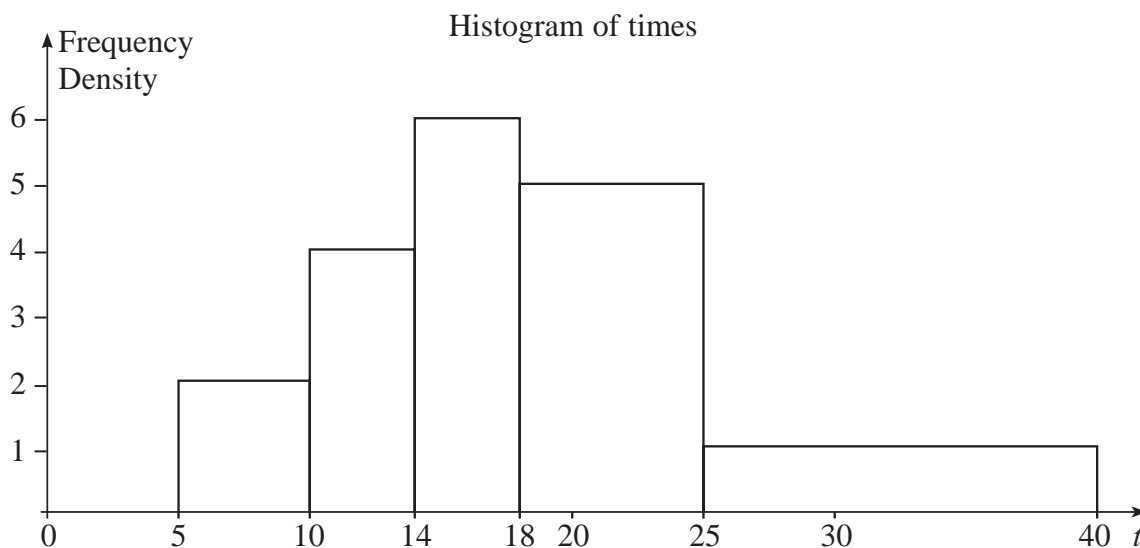


Figure 2

Figure 2 shows a histogram for the variable t which represents the time taken, in minutes, by a group of people to swim 500m.

(a) Complete the frequency table for t .

t	5–10	10–14	14–18	18–25	25–40
Frequency	10	16	24		

(2)

(b) Estimate the number of people who took longer than 20 minutes to swim 500m.

(2)

(c) Find an estimate of the mean time taken.

(4)

(d) Find an estimate for the standard deviation of t .

(3)

(e) Find the median and quartiles for t .

(4)

One measure of skewness is found using $\frac{3(\text{mean} - \text{median})}{\text{standard deviation}}$.

(f) Evaluate this measure and describe the skewness of these data.

(2)



7. The random variable X has probability distribution

x	1	3	5	7	9
$P(X = x)$	0.2	p	0.2	q	0.15

(a) Given that $E(X) = 4.5$, write down two equations involving p and q . (3)

Find

(b) the value of p and the value of q , (3)

(c) $P(4 < X \leq 7)$. (2)

Given that $E(X^2) = 27.4$, find

(d) $\text{Var}(X)$, (2)

(e) $E(19 - 4X)$, (1)

(f) $\text{Var}(19 - 4X)$. (2)



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Question 7 continued

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(Total 13 marks)

Q7

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TOTAL FOR PAPER: 75 MARKS

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