

**Edexcel GCE**  
**Statistics S1**  
**Bronze Level B4**  
**(Question Paper)**

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Paper Reference(s)

**6683/01**

**Edexcel GCE**

**Statistics S1**

**Bronze Level B4**

**Time: 1 hour 30 minutes**

**Materials required for examination papers**

Mathematical Formulae (Green)

**Items included with question**

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**

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Write the name of the examining body (Edexcel), your centre number, candidate number, the unit title (Statistics S1), the paper reference (6683), your surname, initials and signature.

### **Information for Candidates**

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A booklet 'Mathematical Formulae and Statistical Tables' is provided.

Full marks may be obtained for answers to ALL questions.

There are 6 questions in this question paper. The total mark for this paper is 75.

### **Advice to Candidates**

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You must ensure that your answers to parts of questions are clearly labelled.

You must show sufficient working to make your methods clear to the Examiner. Answers without working may gain no credit.

### **Suggested grade boundaries for this paper:**

<b>A*</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>70</b>	<b>65</b>	<b>58</b>	<b>51</b>	<b>46</b>	<b>40</b>

1. A teacher is monitoring the progress of students using a computer based revision course. The improvement in performance,  $y$  marks, is recorded for each student along with the time,  $x$  hours, that the student spent using the revision course. The results for a random sample of 10 students are recorded below.

$x$ hours	1.0	3.5	4.0	1.5	1.3	0.5	1.8	2.5	2.3	3.0
$y$ marks	5	30	27	10	-3	-5	7	15	-10	20

[You may use  $\sum x = 21.4$ ,  $\sum y = 96$ ,  $\sum x^2 = 57.22$ ,  $\sum xy = 313.7$  ]

- (a) Calculate  $S_{xx}$  and  $S_{xy}$ . (3)
- (b) Find the equation of the least squares regression line of  $y$  on  $x$  in the form  $y = a + bx$ . (4)
- (c) Give an interpretation of the gradient of your regression line. (1)

Rosemary spends 3.3 hours using the revision course.

- (d) Predict her improvement in marks. (2)

Lee spends 8 hours using the revision course claiming that this should give him an improvement in performance of over 60 marks.

- (e) Comment on Lee's claim. (1)

**January 2009**

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2. The random variable  $X$  has probability distribution given in the table below.

$x$	-1	0	1	2	3
$P(X = x)$	$p$	$q$	0.2	0.15	0.15

Given that  $E(X) = 0.55$ , find

- (a) the value of  $p$  and the value of  $q$ , (5)
- (b)  $\text{Var}(X)$ , (4)
- (c)  $E(2X - 4)$ . (2)

**May 2008**

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

Chocolate brand	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>
$x$ (% 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) 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 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)

**June 2007**

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4. The discrete random variable  $X$  has probability function

$$P(X = x) = \begin{cases} a(3-x) & x = 0, 1, 2 \\ b & x = 3 \end{cases}$$

- (a) Find  $P(X = 2)$  and copy and complete the table below.

$x$	0	1	2	3
$P(X=x)$	$3a$	$2a$		$b$

(1)

Given that  $E(X) = 1.6$ ,

- (b) find the value of  $a$  and the value of  $b$ .

(5)

Find

- (c)  $P(0.5 < X < 3)$ ,

(2)

- (d)  $E(3X - 2)$ .

(2)

- (e) Show that the  $\text{Var}(X) = 1.64$

(3)

- (f) Calculate  $\text{Var}(3X - 2)$ .

(2)

**May 2009**

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5. The random variable  $X$  has a normal distribution with mean 30 and standard deviation 5.

- (a) Find  $P(X < 39)$ .

(2)

- (b) Find the value of  $d$  such that  $P(X < d) = 0.1151$ .

(4)

- (c) Find the value of  $e$  such that  $P(X > e) = 0.1151$ .

(2)

- (d) Find  $P(d < X < e)$ .

(2)

**January 2009**

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6. 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)

June 2007

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**TOTAL FOR PAPER: 75 MARKS**

**END**