

**6683/01**

# Edexcel GCE

## Statistics S1

## Advanced/Advanced Subsidiary

## Tuesday 15 January 2008 – Morning

Time: 1 hour 30 minutes

Examiner's use only

--	--	--

Team Leader's use only

--	--	--

[illegible]

---

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 formulae stored in them.**

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.

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.

---

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.

This publication may be reproduced only in accordance with Edexcel Limited copyright policy.  
©2008 Edexcel Limited.

Printer's Log. No.

Printer's Log. No.  
M29283A

W850/R6683/57570 3/3/3/3/3



M 2 9 2 8 3 A 0 1 2 4

*Turn over*

**edexcel**   
advancing learning, changing lives

1. A personnel manager wants to find out if a test carried out during an employee's interview and a skills assessment at the end of basic training is a guide to performance after working for the company for one year.

The table below shows the results of the interview test of 10 employees and their performance after one year.

Employee	$A$	$B$	$C$	$D$	$E$	$F$	$G$	$H$	$I$	$J$
Interview test, $x$ %.	65	71	79	77	85	78	85	90	81	62
Performance after one year, $y$ %.	65	74	82	64	87	78	61	65	79	69

[You may use  $\sum x^2 = 60\,475$ ,  $\sum y^2 = 53\,122$ ,  $\sum xy = 56\,076$ ]

- (a) Showing your working clearly, calculate the product moment correlation coefficient between the interview test and the performance after one year.

(5)

The product moment correlation coefficient between the skills assessment and the performance after one year is  $-0.156$  to 3 significant figures.

- (b) Use your answer to part (a) to comment on whether or not the interview test and skills assessment are a guide to the performance after one year. Give clear reasons for your answers.

(2)





Patient	$A$	$B$	$C$	$D$	$E$	$F$	$G$	$H$	$I$	$J$	$K$	$L$
Cotinine level, $x$	160	390	169	175	125	420	171	250	210	258	186	243

(a) Find the mean and standard deviation of the level of cotinine in a patient's blood. **(4)**

(b) Find the median, upper and lower quartiles of these data. (3)

(c) Identify which patient(s) may have been smoking more than a packet of cigarettes a day. Show your working clearly. (4)

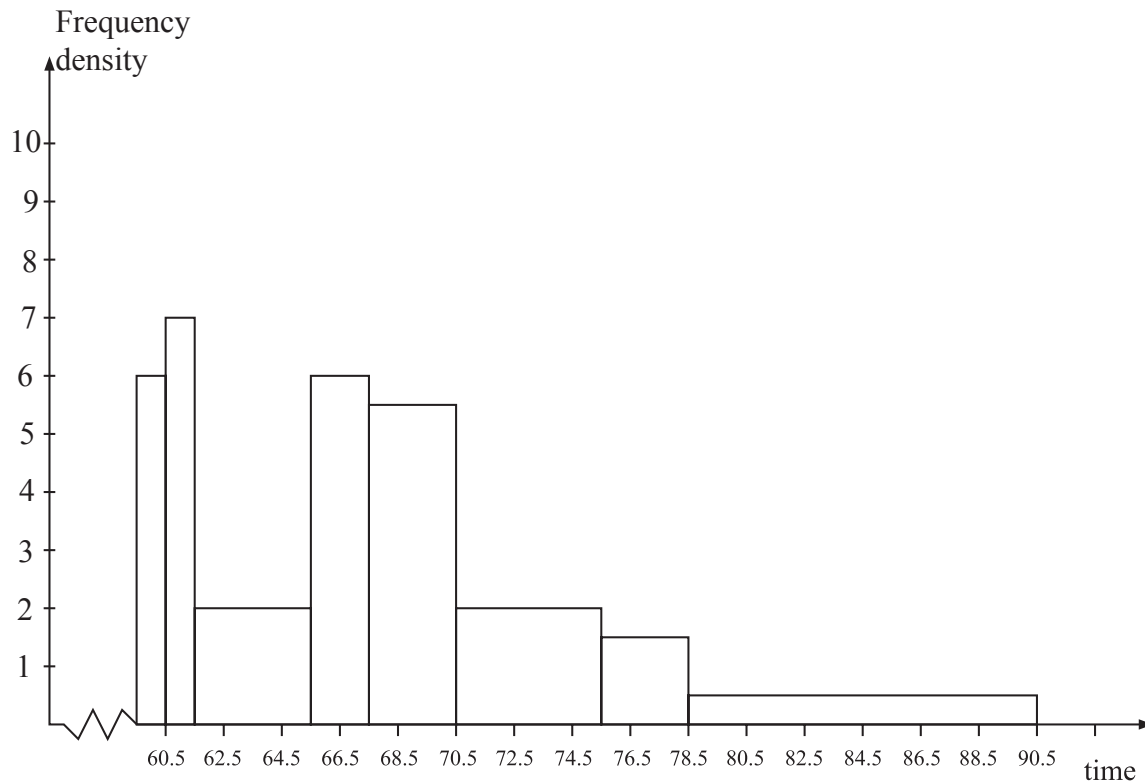
One measure of skewness is found using  $\frac{(Q_1 - 2Q_2 + Q_3)}{(Q_3 - Q_1)}$ .

(d) Evaluate this measure and describe the skewness of these data. (3)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



3. The histogram in Figure 1 shows the time taken, to the nearest minute, for 140 runners to complete a fun run.



**Figure 1**

Use the histogram to calculate the number of runners who took between 78.5 and 90.5 minutes to complete the fun run.

**(5)**

Age, $x$ (years)	2	2.5	3	4	4.5	4.5	5	3	6	6.5
Mileage, $y$ (thousands)	22	34	33	37	40	45	49	30	58	58

(a) Find  $S_{xx}$  and  $S_{xy}$ .

(b) Find the equation of the least squares regression line in the form  $y=a+bx$ . Give the values of  $a$  and  $b$  to 2 decimal places.

**(4)**

(c) Give a practical interpretation of the slope  $b$ . (1)

(d) Using your answer to part (b), find the mileage predicted by the regression line for a 5 year old car. (2)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



**Turn over**





### Question 5 continued



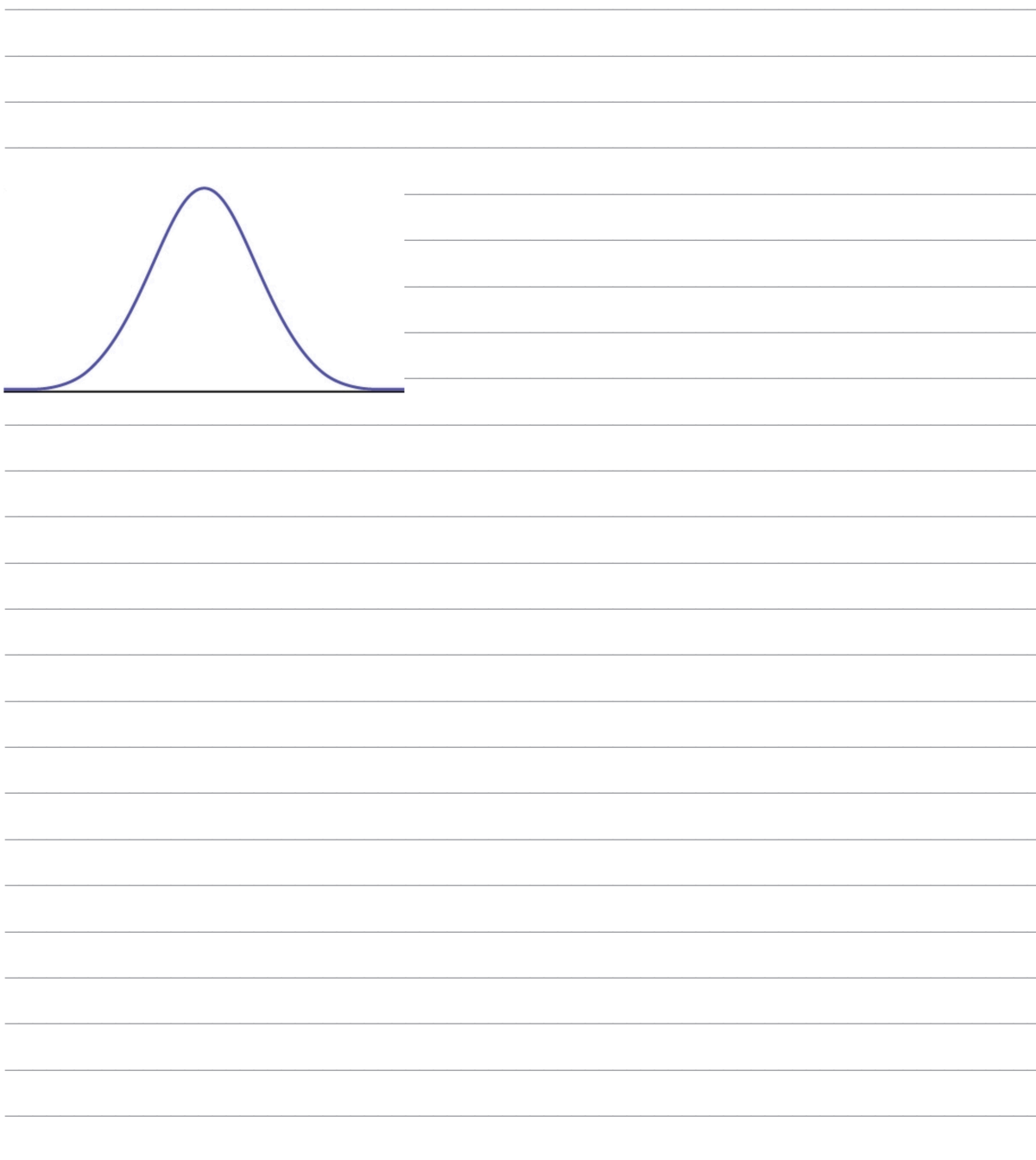
6. The weights of bags of popcorn are normally distributed with mean of 200 g and 60% of all bags weighing between 190 g and 210 g.

(a) Write down the median weight of the bags of popcorn. (1)

(b) Find the standard deviation of the weights of the bags of popcorn. (5)

A shopkeeper finds that customers will complain if their bag of popcorn weighs less than 180 g.

(c) Find the probability that a customer will complain. (3)



7. Tetrahedral dice have four faces. Two fair tetrahedral dice, one red and one blue, have faces numbered 0, 1, 2, and 3 respectively. The dice are rolled and the numbers face down on the two dice are recorded. The random variable  $R$  is the score on the red die and the random variable  $B$  is the score on the blue die.

(a) Find  $P(R=3 \text{ and } B=0)$ .

(2)

The random variable  $T$  is  $R$  multiplied by  $B$ .

- (b) Complete the diagram below to represent the sample space that shows all the possible values of  $T$ .

3				
2		2		
1	0			
0				
$B$ / $R$	0	1	2	3

Sample space diagram of  $T$

(3)

- (c) The table below represents the probability distribution of the random variable  $T$ .

$t$	0	1	2	3	4	6	9
$P(T=t)$	$a$	$b$	$1/8$	$1/8$	$c$	$1/8$	$d$

Find the values of  $a$ ,  $b$ ,  $c$  and  $d$ .

(3)

Find the values of

(d)  $E(T)$ , **NO LONGER ON SYLLABUS**

(2)

(e)  $\text{Var}(T)$ . **NO LONGER ON SYLLABUS**

(4)

