

6683/01

Edexcel GCE

Statistics S1

Advanced/Advanced Subsidiary

Thursday 15 May 2008 – Morning

Time: 1 hour 30 minutes

Examiner's use only

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Team Leader's use only

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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 28 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.

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1. A disease is known to be present in 2% of a population. A test is developed to help determine whether or not someone has the disease.

Given that a person has the disease, the test is positive with probability 0.95

Given that a person does not have the disease, the test is positive with probability 0.03

- (a) Draw a tree diagram to represent this information.

(3)

A person is selected at random from the population and tested for this disease.

- (b) Find the probability that the test is positive.

(3)

A doctor randomly selects a person from the population and tests him for the disease. Given that the test is positive,

- (c) find the probability that he does not have the disease.

(2)

- (d) Comment on the usefulness of this test.

(1)



Question 1 continued

2. The age in years of the residents of two hotels are shown in the back to back stem and leaf diagram below.

Abbey Hotel 8|5|0 means 58 years in Abbey hotel and 50 years in Balmoral hotel Balmoral Hotel

(1)	2	0		
(4)	9751	1		
(4)	9831	2	6	(1)
(11)	99997665332	3	447	(3)
(6)	987750	4	005569	(6)
(1)	8	5	000013667	(9)
		6	233457	(6)
		7	015	(3)

For the Balmoral Hotel,

- (a) write down the mode of the age of the residents, (1)
- (b) find the values of the lower quartile, the median and the upper quartile. (3)
- (c) (i) Find the mean, \bar{x} , of the age of the residents.
- (ii) Given that $\sum x^2 = 81\,213$ find the standard deviation of the age of the residents. (4)

One measure of skewness is found using

$$\frac{\text{mean} - \text{mode}}{\text{standard deviation}}$$

- (d) Evaluate this measure for the Balmoral Hotel. (2)

For the Abbey Hotel, the mode is 39, the mean is 33.2, the standard deviation is 12.7 and the measure of skewness is -0.454

- (e) Compare the two age distributions of the residents of each hotel. (3)



Question 2 continued



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

(a) the value of p and the value of q ,

(5)

(b) $\text{Var}(X)$,

(4)

(c) $E(2X - 4)$.

(2)

No longer on syllabus

Question 3 continued



Question 4 continued

5. A person's blood group is determined by whether or not it contains any of 3 substances A , B and C .

A doctor surveyed 300 patients' blood and produced the table below.

Blood contains	No. of Patients
only C	100
A and C but not B	100
only A	30
B and C but not A	25
only B	12
A , B and C	10
A and B but not C	3

- (a) Draw a Venn diagram to represent this information.

(4)



$$F(x) = \frac{(x+k)^2}{25} \text{ for } x=2,3,4$$

(a) Find k .

(2)

(b) Find the probability distribution of X .

(3)

No longer on syllabus

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(3)

(5)

(4)

[illegible]

Leave
blank**Question 7 continued****Q7****(Total 12 marks)****TOTAL FOR PAPER: 75 MARKS****END**