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| Centre No.    |  |  |  |  |  | Paper Reference |   |   |   |   |   |   | Surname   | Initial(s) |
| Candidate No. |  |  |  |  |  | 6               | 6 | 8 | 4 | / | 0 | 1 | Signature |            |

Paper Reference(s)

**6684/01**

# Edexcel GCE

## Statistics S2

## Advanced/Advanced Subsidiary

## Tuesday 15 January 2008 – Morning

Time: 1 hour 30 minutes

Examiner's use only

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Team Leader's use only

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[illegible]

## 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 8 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.

## Advice to Candidates

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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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*Turn over*

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1. (a) Explain what you understand by a census.

(1)

Each cooker produced at GT Engineering is stamped with a unique serial number. GT Engineering produces cookers in batches of 2000. Before selling them, they test a random sample of 5 to see what electric current overload they will take before breaking down.

- (b) Give one reason, other than to save time and cost, why a sample is taken rather than a census.

(1)

- (c) Suggest a suitable sampling frame from which to obtain this sample.

(1)

- (d) Identify the sampling units.

(1)

Q1

(Total 4 marks)



- (b) more than 3 faulty bolts. (2)

(c) Find the probability that exactly 6 of these bags contain more than 3 faulty bolts. (3)

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- (2)

(5)

(4)



$$F(y) = \begin{cases} 0 & y < 1 \\ k(y^4 + y^2 - 2) & 1 \leq y \leq 2 \\ 1 & y > 2 \end{cases}$$

- (a) Show that  $k = \frac{1}{18}$ . (2)
- (b) Find  $P(Y > 1.5)$ . (2)
- (c) Specify fully the probability density function  $f(y)$ . (3)

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- Test Dhriti's claim at the 5% level of significance. State your hypotheses clearly.

(7)

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- (10)

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- (ii) a critical region.

(b) Find the critical region for a two-tailed test of the hypothesis that the number of incoming calls occurs at a rate of 0.45 per 1 minute interval. The probability in each tail should be as close to 2.5% as possible.

(c) Write down the actual significance level of the above test.

In the school holidays, 1 call occurs in a 10 minute interval.

- (d) Test, at the 5% level of significance, whether or not there is evidence that the rate of incoming calls is less during the school holidays than in term time.

Leave  
blank**Question 7 continued**

8. The continuous random variable  $X$  has probability density function  $f(x)$  given by

$$f(x) = \begin{cases} 2(x-2) & 2 \leq x \leq 3 \\ 0 & \text{otherwise} \end{cases}$$

- (a) Sketch  $f(x)$  for all values of  $x$ . (3)

- (b) Write down the mode of  $X$ . (1)

Find

- (c)  $E(X)$ , (3)

- (d) the median of  $X$ . (4)

- (e) Comment on the skewness of this distribution. Give a reason for your answer. (2)



