

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

Friday 14 January 2011 – Afternoon

Time: 1 hour 30 minutes

Examiner's use only

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Team Leader's use only

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[illegible]

Materials required for examination

Mathematical Formulae (Pink)

Items included with question papers

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.

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 to 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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- (d) Using a suitable approximation, find the probability that the doctor will offer all patients a vaccination.
- (3)**

2. A student takes a multiple choice test. The test is made up of 10 questions each with 5 possible answers. The student gets 4 questions correct. Her teacher claims she was guessing the answers. Using a one tailed test, at the 5% level of significance, test whether or not there is evidence to reject the teacher's claim.
State your hypotheses clearly.

(6)





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Question 3 continued



4. Richard regularly travels to work on a ferry. Over a long period of time, Richard has found that the ferry is late on average 2 times every week. The company buys a new ferry to improve the service. In the 4-week period after the new ferry is launched, Richard finds the ferry is late 3 times and claims the service has improved. Assuming that the number of times the ferry is late has a Poisson distribution, test Richard's claim at the 5% level of significance. State your hypotheses clearly.

(6)

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- (a) Show that $f(x) = 4 - 8x$ for $0 \leq x \leq 0.5$ and specify $f(x)$ for all real values of x . (4)
- (b) Find the cumulative distribution function $F(x)$. (4)
- (c) Find the median of X . (3)
- (d) Write down the mode of X . (1)
- (e) State, with a reason, the skewness of X . (1)

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- (c) find the probability that in any given minute
 - (i) no cars arrive,
 - (ii) more than 3 cars arrive.

(3)
- (d) In any given 4 minute period, find m such that $P(X > m) = 0.0487$

(3)
- (e) Using a suitable approximation find the probability that fewer than 15 cars arrive in any given 10 minute period.

(6)

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Question 6 continued



- $$f(x) = \begin{cases} kx(81 - x^2) & 0 \leq x \leq 9 \\ 0 & \text{otherwise} \end{cases}$$

- (d) Find the probability that at least 2 of the customers queue for more than 5 minutes. (3)

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Question 7 continued

