

Please check the examination details below before entering your candidate information

Candidate surname

Other names

**Pearson Edexcel**  
**International**  
**Advanced Level**

Centre Number

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Candidate Number

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**Wednesday 31 October 2018**

Morning (Time: 1 hour 30 minutes)

Paper Reference **WST02/01**

**Statistics S2**

**Advanced/Advanced Subsidiary**

**You must have: Scientific calculator**

Mathematical Formulae and Statistical Tables (Blue)

Total Marks

**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

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B). Coloured pencils and highlighter pens must not be used.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions and ensure that your answers to parts of questions are clearly labelled.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- You should show sufficient working to make your methods clear. Answers without working may not gain full credit.
- 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

- The total mark for this paper is 75.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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**Pearson**

1. Each day a restaurant opens between 11 am and 11 pm. During its opening hours, the restaurant receives calls for reservations at an average rate of 6 per hour.

- (a) Find the probability that the restaurant receives exactly 1 call for a reservation between 6 pm and 7 pm.

(2)

The restaurant distributes leaflets to local residents to try and increase the number of calls for reservations. After distributing the leaflets, it records the number of calls for reservations it receives over a 90 minute period.

Given that it receives 14 calls for reservations during the 90 minute period,

- (b) test, at the 5% level of significance, whether the rate of calls for reservations has increased from 6 per hour. State your hypotheses clearly.

(5)

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Question 1 continued

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(Total 7 marks)

Q1





**Question 2 continued**

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Question 2 continued

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(Total 13 marks)

Q2

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$$f(x) = \begin{cases} \frac{1}{9}(x+5)(3-x) & 1 \leq x \leq 4 \\ 0 & \text{otherwise} \end{cases}$$

(a) Sketch  $f(x)$  and comment on Albert's belief.

(3)

$$g(y) = \begin{cases} ky(12 - y^2) & 1 \leq y \leq 3 \\ 0 & \text{otherwise} \end{cases}$$

(b) Use calculus to find the mode of  $Y$

(3)

(c) Use algebraic integration to find the value of  $k$

(3)

(d) Find the median of  $Y$  giving your answer to 3 significant figures.

(3)

(e) Describe the skewness of the distribution of  $Y$  giving a reason for your answer.

(2)



**Question 3 continued**

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### Question 3 continued

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**Question 3 continued**

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**(Total 14 marks)**

**Q3**



- (e) State the actual significance level of this test. (1)

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### Question 4 continued

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Question 4 continued

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(Total 9 marks)

Q4



5. The random variable  $X$  has cumulative distribution function given by

$$F(x) = \begin{cases} 0 & x < 0 \\ \frac{1}{100}(ax^3 + bx^2 + 15x) & 0 \leq x \leq 5 \\ 1 & x > 5 \end{cases}$$

Given that  $E(X^2) = 6.25$

- (a) show that  $6a + b = 0$  (5)
- (b) find the value of  $a$  and the value of  $b$  (4)
- (c) find  $P(3 \leq X \leq 7)$  (2)

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Question 5 continued

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Question 5 continued

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(Total 11 marks)

Q5



- (c) find the probability that  $W$  is greater than 1.9 for at least 5 of these squares. (4)

Question 6 continued

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Question 6 continued

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(Total 9 marks)

Q6







Question 7 continued

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### Question 7 continued

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Question 7 continued

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**TOTAL FOR PAPER: 75 MARKS**

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