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Surname

Other names

Pearson Edexcel
International
Advanced Level

Centre Number

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Candidate Number

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Statistics S2

Advanced/Advanced Subsidiary

Wednesday 24 January 2018 – Afternoon

Time: 1 hour 30 minutes

Paper Reference

WST02/01

You must have:

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. A continuous random variable X has cumulative distribution function

$$F(x) = \begin{cases} 0 & x < 1 \\ \frac{1}{16}(x-1)^2 & 1 \leq x \leq 5 \\ 1 & x > 5 \end{cases}$$

- (a) Find $P(X > 4)$ (2)
- (b) Find $P(X > 3 \mid 2 < X < 4)$ (3)
- (c) Find the exact value of $E(X)$ (4)

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Question 1 continued

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Q1

(Total 9 marks)



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Question 2 continued

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Question 2 continued

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Q2

(Total 8 marks)



- (e) Find the probability that the weight given by the scales is within 1 gram of the true weight for at least 6 of the bananas. (3)

Question 3 continued

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Question 3 continued

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Q3

(Total 9 marks)



- (4)

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(4)

Question 4 continued

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Question 4 continued

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(Total 11 marks)

Q4



- (e) Using a suitable approximation, find the probability that more than 27 packages are lost during a randomly selected 4-month period. (5)

Question 5 continued

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Question 5 continued

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Q5

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(Total 15 marks)



- (2)

Question 6 continued

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Question 6 continued

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Question 6 continued

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(Total 8 marks)

Q6



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

$$f(x) = \begin{cases} \frac{1}{16}x^2 & 1 \leq x < 3 \\ k(4 - x) & 3 \leq x \leq 4 \\ 0 & \text{otherwise} \end{cases}$$

(a) Show that $k = \frac{11}{12}$ (3)

(b) Sketch $f(x)$ for $1 \leq x \leq 4$ (2)

(c) Write down the mode of X (1)

Given that $E(X) = \frac{25}{9}$

(d) use algebraic integration to find $\text{Var}(X)$, giving your answer to 3 significant figures. (4)

The cumulative distribution function of X is given by

$$F(x) = \begin{cases} 0 & x < 1 \\ \frac{1}{48}(x^3 + c) & 1 \leq x < 3 \\ \frac{11}{12}(4x - \frac{1}{2}x^2 + d) & 3 \leq x \leq 4 \\ 1 & x > 4 \end{cases}$$

(e) (i) Find the exact value of c
(ii) Find the exact value of d (3)

(f) Calculate, to 3 significant figures, the upper quartile of X (2)

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Question 7 continued

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Question 7 continued

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11

TOTAL FOR PAPER: 75 MARKS

28

