

Write your name here

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

Monday 22 June 2015 – Morning

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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Question 2 continued

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3. A piece of spaghetti has length $2c$, where c is a positive constant. It is cut into two pieces at a random point. The continuous random variable X represents the length of the longer piece and is uniformly distributed over the interval $[c, 2c]$.

(a) Sketch the graph of the probability density function of X (2)

(b) Use integration to prove that $\text{Var}(X) = \frac{c^2}{12}$ (6)

(c) Find the probability that the longer piece is more than twice the length of the shorter piece. (3)



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5. A bag contains a large number of counters with 35% of the counters having a value of 6 and 65% of the counters having a value of 9

A random sample of size 2 is taken from the bag and the value of each counter is recorded as X_1 and X_2 respectively.

The statistic Y is calculated using the formula

$$Y = \frac{2X_1 + X_2}{3}$$

- (a) List all the possible values of Y . (2)
- (b) Find the sampling distribution of Y . (5)
- (c) Find $E(Y)$. (2)



7. A random variable X has probability density function

$$f(x) = \begin{cases} \frac{2x}{15} & 0 \leq x \leq k \\ \frac{1}{5}(5-x) & k < x \leq 5 \\ 0 & \text{otherwise} \end{cases}$$

(a) Showing your working clearly, find the value of k . (5)

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

(c) Find $P\left(X \leq \frac{k}{2} \mid X \leq k\right)$ (4)



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Question 7 continued

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