

Write your name here	
Surname	Other names
Pearson Edexcel International Advanced Level	Centre Number
Candidate Number 	
Statistics S2 Advanced/Advanced Subsidiary	
Wednesday 1 November 2017 – 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.

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Q1

(Total 9 marks)

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2. The weekly sales, S , in thousands of pounds, of a small business has probability density function

$$f(s) = \begin{cases} k(s-2)(10-s) & 2 < s < 10 \\ 0 & \text{otherwise} \end{cases}$$

- (a) Use algebraic integration to show that $k = \frac{3}{256}$ (4)

- (b) Write down the value of $E(S)$ (1)

- (c) Use algebraic integration to find the standard deviation of the weekly sales. (6)

A week is selected at random.

- (d) Showing your working, find the probability that this week's sales exceed £7100
Give your answer to one decimal place. (2)

A quarter is defined as 12 consecutive weeks.

The discrete random variable X is the number of weeks in a quarter in which the weekly sales exceed £7100

The manager earns a bonus at the following rates:

X	Bonus Earned
$X \leq 5$	£0
$X = 6$	£1000
$X \geq 7$	£5000

- (e) Using your answer to part (d), calculate the manager's expected bonus per quarter. (5)

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Question 4 continued

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5. The continuous random variable Y has cumulative distribution function $F(y)$ given by

$$F(y) = \begin{cases} 0 & y < 3 \\ k(y^2 - 2y - 3) & 3 \leq y \leq \alpha \\ 4k(2y - 7) & \alpha < y \leq 6 \\ 1 & y > 6 \end{cases}$$

where k and α are constants.

- (a) Find $P(4.5 < Y \leq 5.5)$ (7)

- (b) Find the probability density function $f(y)$ (3)

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6. A fair 6-sided die is thrown n times. The number of sixes, X , is recorded. Using a normal approximation, $P(X < 50) = 0.0082$ correct to 4 decimal places.

Find the value of n .

(10)

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Q6

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