

Please check the examination details below before entering your candidate information

Candidate surname	Other names
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Pearson Edexcel
International
Advanced Level

Centre Number

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Candidate Number

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Thursday 23 May 2019

Morning (Time: 1 hour 30 minutes)	Paper Reference WST03/01
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Mathematics
International Advanced Subsidiary/Advanced Level
Statistics S3

You must have:
Mathematical Formulae and Statistical Tables (Blue), calculator

Total Marks

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Candidates may use any calculator permitted by Pearson regulations. 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).
- **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.
- Inexact answers should be given to three significant figures unless otherwise stated.

Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- There are 8 questions in this question paper. 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.
- If you change your mind about an answer, cross it out and put your new answer and any working underneath.

Turn over ►

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2. A holiday camp manager wishes to investigate the popularity of the three activities the camp offers to teenagers who attend. A random sample of 560 teenagers, who attended the camp, are asked which of the three activities is their favourite. The results are given in the table below.

		Activity		
		Water sports	Bushcraft	Mountain activities
Gender	Boys	142	96	90
	Girls	110	46	76

(a) Test, at the 5% level of significance, whether or not there is evidence of an association between the teenagers' favourite activity and their gender. Show your working clearly, stating your hypotheses and degrees of freedom. You should state your expected frequencies correct to 2 decimal places where necessary.

(9)

(b) State which of the three activities could be worth further investigation. Give a reason for your answer.

(1)



Question 2 continued

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Q2

(Total 10 marks)

3. In a singing competition, 9 people are asked to sing individually. Jamil is blindfolded and asked to rank the 9 singers in order of increasing age by listening to their voices.

Jamil places them in the order $B C A G F I E H D$

The actual ages, in years, of the 9 singers are shown in the table below.

Singer	A	B	C	D	E	F	G	H	I
Age	15	23	32	50	45	22	19	63	54

- (a) Calculate Spearman's rank correlation coefficient between Jamil's order and the actual order. (5)
- (b) Stating your hypotheses clearly, test whether or not there is evidence to suggest that Jamil can rank singers in order of age by listening to them sing. Use a 5% level of significance. (4)
- (c) Explain, without doing any further calculations, how you would find the rank correlation if singer F 's age was recorded incorrectly and is 23 rather than 22 (2)

Question 3 continued

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Q3

(Total 11 marks)

Question 6 continued

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Question 6 continued

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Q6

(Total 14 marks)

Question 7 continued

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Question 7 continued

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Lined writing area for the answer to Question 7.

(Total 9 marks)

Q7

Question 8 continued

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