

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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Pearson Edexcel International Advanced Level

Time 1 hour 30 minutes

Paper
reference

WST03/01

Mathematics

International Advanced Subsidiary/Advanced Level Statistics S3

You must have:

Mathematical Formulae and Statistical Tables (Yellow), calculator

Total Marks

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.
- Values from the statistical tables should be quoted in full. If a calculator is used instead of the tables, the value should be given to an equivalent degree of accuracy.
- Inexact answers should be given to three significant figures unless otherwise stated.

Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- There are 7 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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Q:1/1/




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1. The table below shows the number of televised tournaments won and the total number of tournaments won by the top 10 ranked darts players in 2020

Player's rank	Televised tournaments won	Total tournaments won
1	55	135
2	7	33
3	5	17
4	2	14
5	4	9
6	2	5
7	9	36
8	0	15
9	3	3
10	0	13

Michael did not want to calculate Spearman's rank correlation coefficient between player's rank and the rank in televised tournaments won because there would be tied ranks.

- (a) Explain how Michael could have dealt with these tied ranks. (1)

Given that the largest number of total tournaments won is ranked number 1

- (b) calculate the value of Spearman's rank correlation coefficient between player's rank and the rank in total tournaments won. (4)

- (c) Stating your hypotheses and critical value clearly, test at the 5% level of significance, whether or not there is evidence of a positive correlation between player's rank and the rank in total tournaments won for these darts players. (4)

Michael does not believe that there is a positive correlation between player's rank and the rank in total number of tournaments won.

- (d) Find the largest level of significance, that is given in the tables provided, which could be used to support Michael's claim.
You must state your critical value. (1)



Question 5 continued

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(Total for Question 5 is 9 marks)



P 7 2 4 6 9 A 0 1 9 2 8

6 A particular lift has a maximum load capacity of 700 kg.

The weights of men are normally distributed with mean 80 kg and standard deviation 10 kg.

The weights of women are normally distributed with mean 69 kg and standard deviation 5 kg.

You may assume that weights of people are independent.

- (a) Find the probability that when 6 men and 3 women are in the lift, the load exceeds 700 kg.

(4)

A sign in the lift states: "Maximum number of people in the lift is c "

- (b) Find the value of c such that the probability of the load exceeding 700 kg is less than 2.5% no matter the gender of the occupants.

(6)



Question 6 continued

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Question 6 continued

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(Total for Question 6 is 10 marks)



P 7 2 4 6 9 A 0 2 3 2 8

- 7 The following table shows observed frequencies, where x is an integer, from an experiment to test whether or not a six-sided die is biased.

Number on die	1	2	3	4	5	6
Observed frequency	$x + 6$	$x - 8$	$x + 8$	$x - 5$	$x + 4$	$x - 5$

A goodness of fit test is conducted to determine if there is evidence that the die is biased.

- (a) Write down suitable null and alternative hypotheses for this test. (1)

It is found that the null hypothesis is not rejected at the 5% significance level.

- (b) Hence
- (i) find the minimum value of x (8)
- (ii) determine the minimum number of times the die was rolled. (2)



Question 7 continued

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Question 7 continued

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Question 7 continued

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(Total for Question 7 is 11 marks)

TOTAL FOR PAPER: 75 MARKS

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