Surname		Other Names	
Centre Number			Candidate Number									
Candidate Signature												

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General Certificate of Secondary Education
November 2004

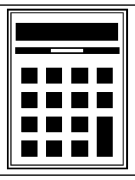
ASSESSMENT and QUALIFICATIONS ALLIANCE

MATHEMATICS (MODULAR) (SPECIFICATION B) 33001/HA
Module 1 Higher Tier Section A

H

Wednesday 17 November 2004 1.30 pm to 1.55 pm

In addition to this paper you will require:
- a calculator
- mathematical instruments
- a treasury tag.



Time allowed for Section A: 25 minutes

Instructions
- Use blue or black ink or ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- Do all rough work in this booklet.
- This paper is divided into **two** sections: Section A and Section B.
- After the 25 minutes allowed for Section A, you must put your calculator on the floor under your seat. You will then be given Section B.
- When you have answered Section B you may work again on Section A but you may **not** use your calculator. It must remain on the floor under your seat.
- At the end of the examination tag Section A and Section B together with Section A on top.

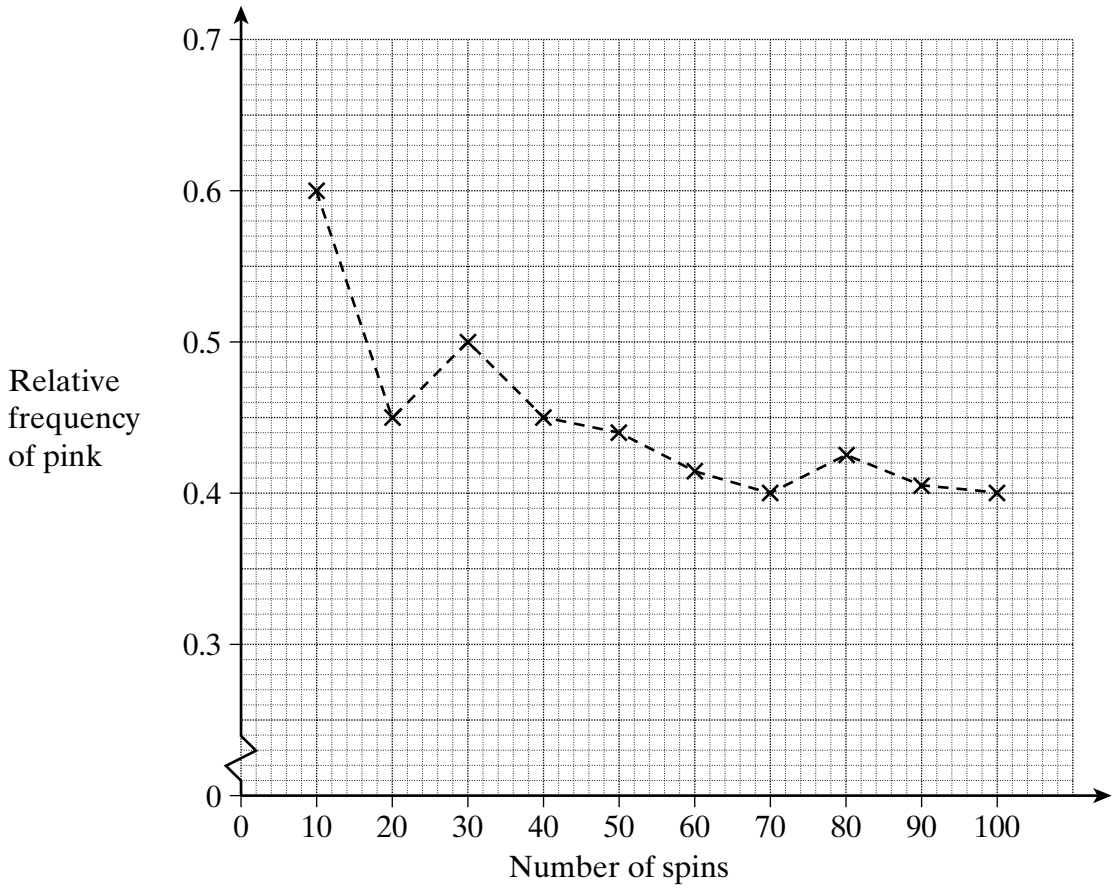
Information
- The maximum mark for Section A is 20.
- Mark allocations are shown in brackets.
- Additional answer paper and graph paper will be issued on request and must be tagged securely to this answer booklet.
- You are expected to use a calculator where appropriate.

Advice
- In all calculations, show clearly how you work out your answer.

For Examiner's Use			
Section A		Section B	
Number	Mark	Number	Mark
1		5	
2		6	
3		7	
4		8	
Total Section A			
Total Section B			
TOTAL			
Examiner's Initials			

Answer **all** questions in the spaces provided.

1 Kali has a spinner with coloured sections of equal size.
She wants to know the probability that her spinner lands on pink.
She spins it 100 times and calculates the relative frequency of pink after every 10 spins.
Her results are shown on the graph.



(a) Use the graph to calculate the number of times that the spinner landed on pink

(i) after the first 10 spins,

.....

Answer ..... *(2 marks)*

(ii) after the first 50 spins.

.....

Answer ..... *(2 marks)*

(b) From the graph, estimate the probability of the spinner landing on pink.

.....

Answer ..... *(1 mark)*

(c) Kali's results confirm that her spinner is fair.
The spinner has five equal sections.

(i) How many sections are pink?

.....

Answer ..... *(1 mark)*

(ii) Kali spins the spinner two more times.

What is the theoretical probability that the spinner lands on pink both times?

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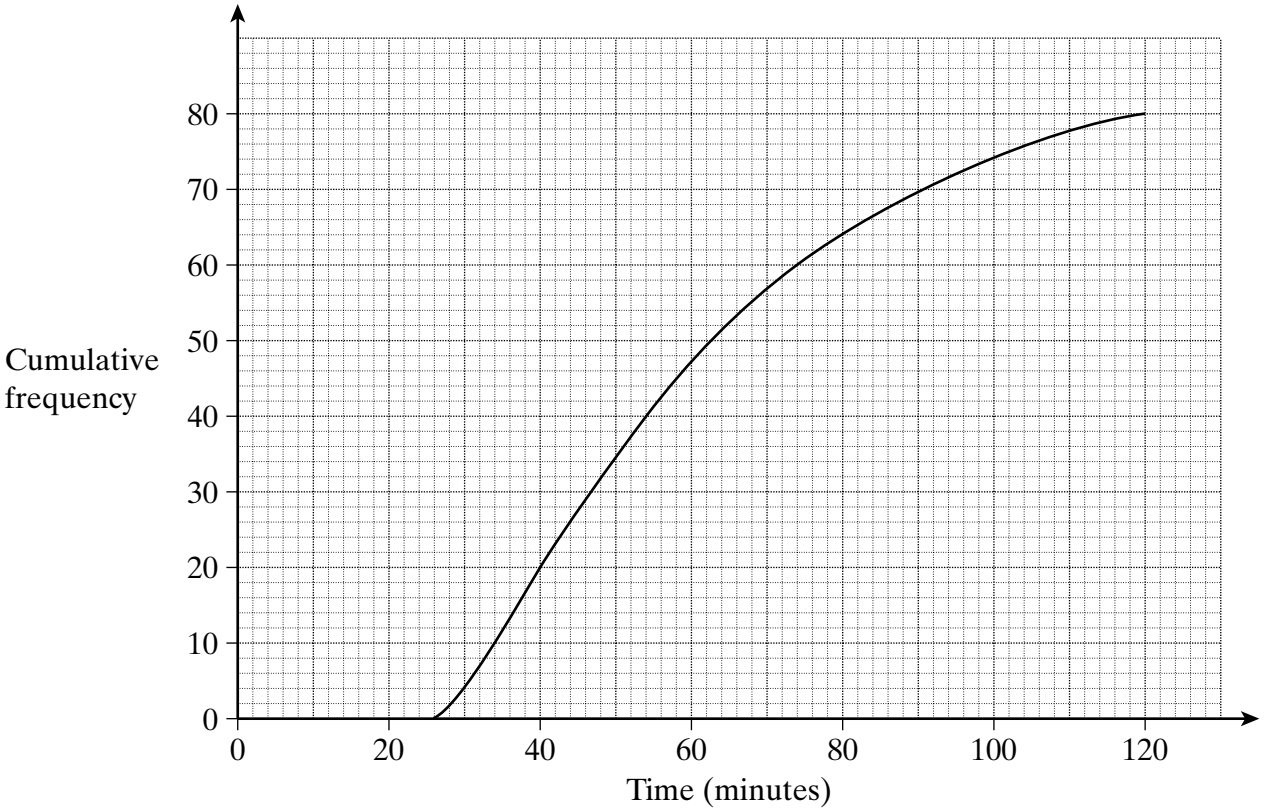
Answer ..... *(2 marks)*

8

TURN OVER FOR THE NEXT QUESTION

2 The journey times of 80 commuters are shown on the cumulative frequency diagram below.



Use the diagram to estimate

(a) the median journey time of these commuters,

.....

Answer ..... minutes *(1 mark)*

(b) the interquartile range of the journey times of these commuters.

.....

.....

Answer ..... minutes *(2 marks)*

3

3 A college wants to obtain a sample of its student population.
The college decides to take a stratified sample of size 200 by ethnic group.

The table shows the student population by ethnic group.

Ethnic group	Student population
White	725
Black	388
Asian	186
Other	151

(a) Show that the college should choose 26 Asian students as part of its sample.

.....

.....

.....

(2 marks)

(b) Calculate the number of students that the college should choose from each of the ethnic groups.

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.....

.....

Answer White .....

Black .....

Asian .....26.....

Other .....

(3 marks)

5

4 A computer is used to generate three-digit random numbers from 000 to 999, e.g. 006, 000, 977, 125, …

Given that a generated number is a multiple of 3, find the probability that it is also a multiple of 4.

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Answer ..... *(4 marks)*

4

END OF SECTION A

Surname		Other Names	
Centre Number						Candidate Number				
Candidate Signature										

General Certificate of Secondary Education
November 2004

ASSESSMENT and QUALIFICATIONS ALLIANCE

MATHEMATICS (MODULAR) (SPECIFICATION B) 33001/HB
Module 1 Higher Tier Section B

H

Wednesday 17 November 2004 2.00 pm to 2.25 pm

In addition to this paper you will require: mathematical instruments. You must **not** use a calculator.	

Time allowed for Section B: 25 minutes

Instructions

- Use blue or black ink or ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- Do all rough work in this booklet.
- You may **not** use your calculator in Section B. Your calculator must remain on the floor under your seat.
- When you have answered Section B you may work again on Section A but you may **not** use your calculator. It must remain on the floor under your seat.
- At the end of the examination tag Section A and Section B together with Section A on top.

Information

- The maximum mark for Section B is 20.
- Mark allocations are shown in brackets.
- Additional answer paper and graph paper will be issued on request and must be tagged securely to this answer booklet.

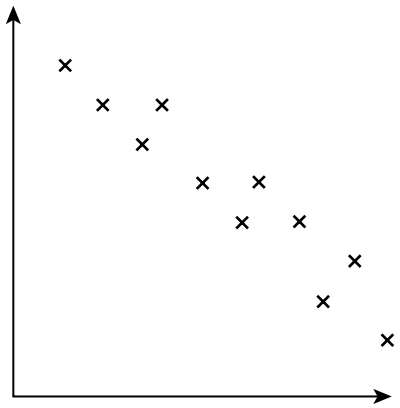
Advice

- In all calculations, show clearly how you work out your answer.

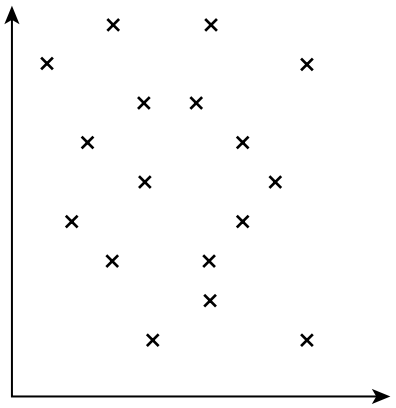
LEAVE MARGIN BLANK

Answer **all** questions in the spaces provided.

5 (a) Write down the type of correlation shown in each of the scatter graphs, A and B, below.



Scatter graph A

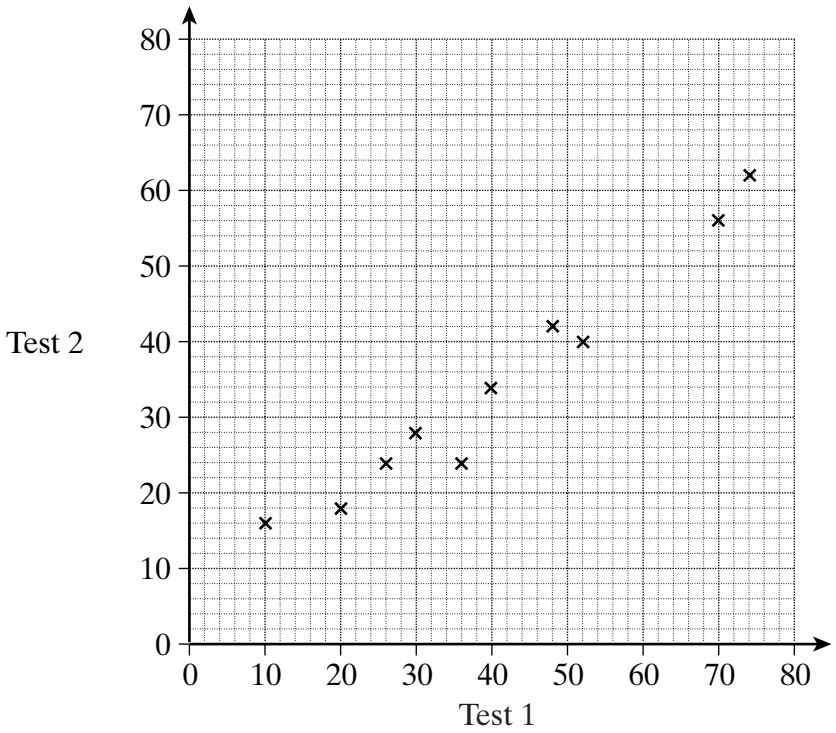


Scatter graph B

Answer A ..... Answer B .....

(2 marks)

(b) The marks for a group of pupils who sat two tests are shown in the scatter graph below.



Estimate the Test 1 mark for a pupil who scored 50 in Test 2.
Show how you obtained your answer.

.....

.....

Answer ..... *(2 marks)*

6 Bob is taking penalties.
The probability that Bob scores from the penalty spot is $\frac{3}{5}$ for each penalty.
Bob takes two penalties.

(a) Draw a fully labelled tree diagram showing all the probabilities.

(3 marks)

(b) Calculate the probability that Bob scores exactly once on his two attempts.

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Answer ..... *(3 marks)*

6

7 The table summarises the distances thrown in the discus event by 20 boys during a school sports day.

Distance, x (metres)	**Number of boys**
$0 < x \leqslant 5$	1
$5 < x \leqslant 10$	0
$10 < x \leqslant 20$	9
$20 < x \leqslant 30$	5
$30 < x \leqslant 35$	4
$35 < x \leqslant 40$	1

(a) Draw a histogram to represent this data.

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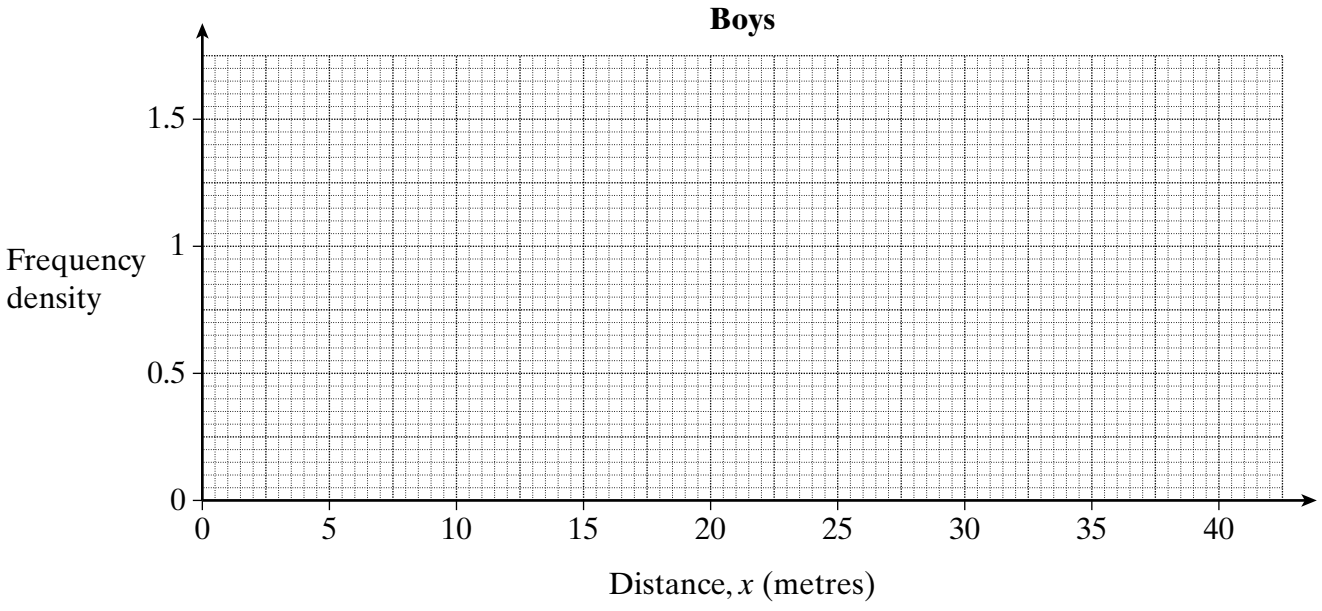
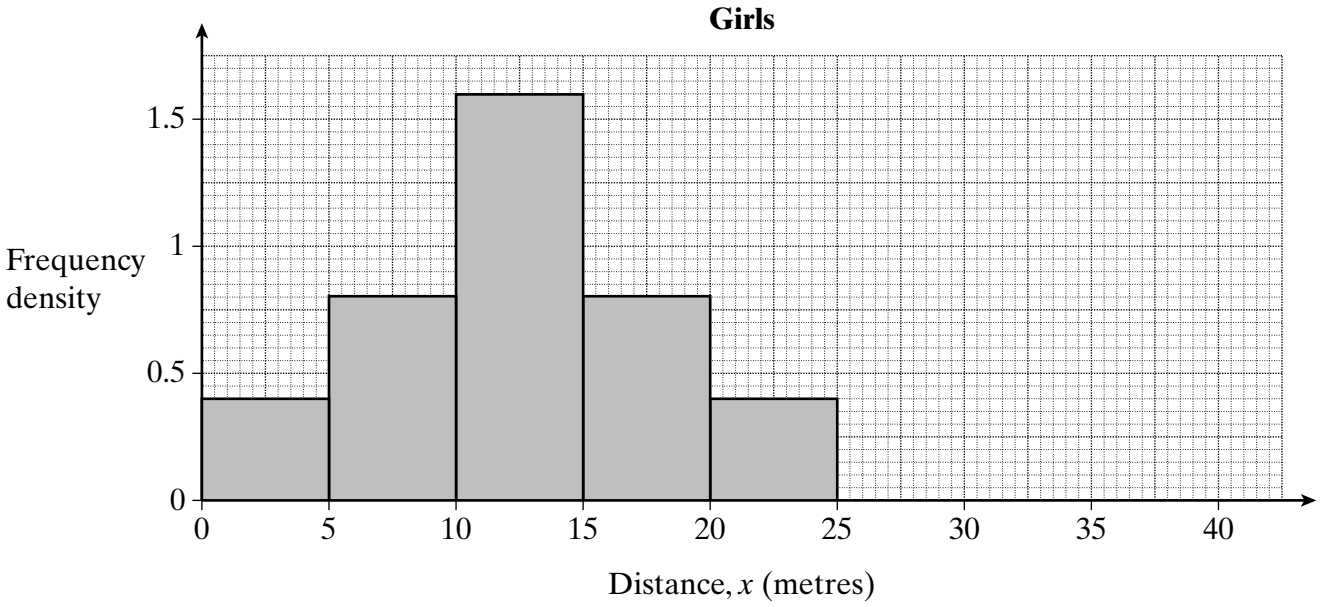


(3 marks)

(b) The distances thrown in the discus event by 20 girls are represented by the histogram below.



Write down **two** comparisons between the distances thrown by the boys and the girls.

Comparison 1 .....

.....

Comparison 2 .....

.....

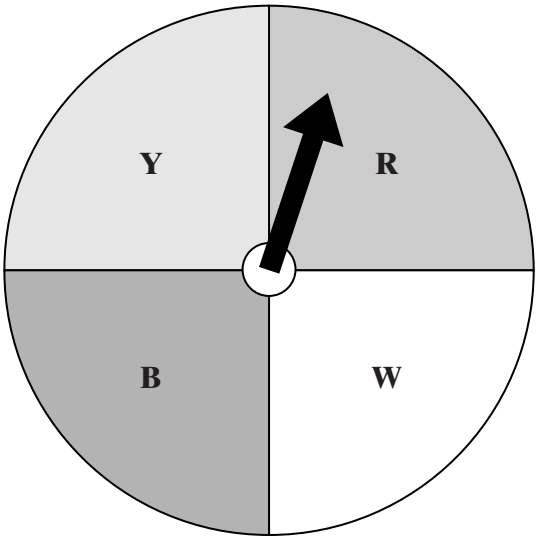
(2 marks)

5

TURN OVER FOR THE NEXT QUESTION

8 A fair spinner has four equal sections.

The sections are coloured red (R), white (W), blue (B) and yellow (Y).



The arrow on the spinner is spun three times.

Calculate the probability that the arrow lands on the same colour at least twice.

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Answer ..... *(5 marks)*

5

END OF QUESTIONS