Surname		Other Names	
Centre Number			Candidate Number	
Candidate Signature			

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General Certificate of Secondary Education
March 2006

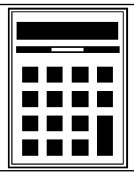
ASSESSMENT and QUALIFICATIONS ALLIANCE

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

Monday 6 March 2006 1.30 pm to 1.55 pm

H

For this paper you must have:
- 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.
- Answer the questions in the spaces provided.
- Use a calculator where appropriate.
- Do all rough work in this book.
- 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.
- The marks for questions are shown in brackets.
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer book.

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 Ronnie is a snooker player.
He takes 20 practice shots at potting the black ball.
The table shows whether he pots the black ball (✔) or misses (×) on each shot.

Shot number	1	2	3	4	5	6	7	8	9	10
Result	×	×	✔	×	✔	×	✔	✔	×	✔

Shot number	11	12	13	14	15	16	17	18	19	20
Result	×	✔	✔	✔	×	✔	✔	×	✔	×

(a) Write down the relative frequency of Ronnie potting the black ball by using the results from

(i) his first five shots

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

(ii) his first ten shots.

.....

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

(b) Ronnie states that, on average, he can pot the black ball on more than 50% of his shots.

Explain how the results from the table support his statement.

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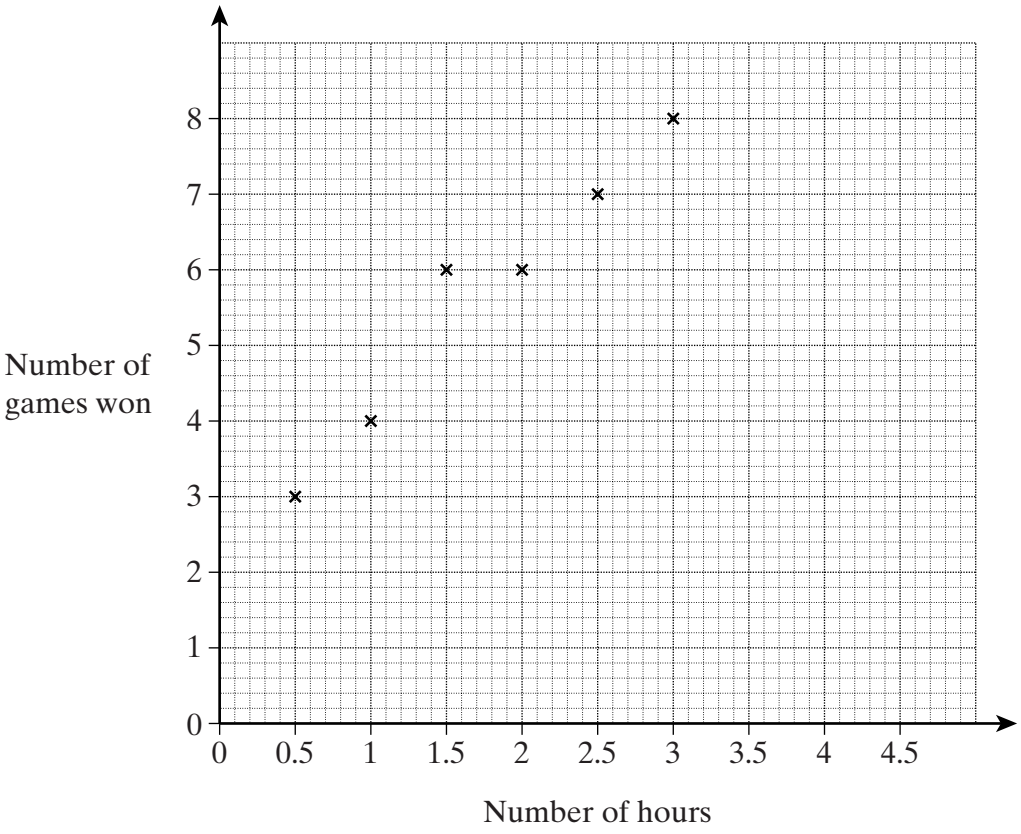
(1 mark)

In a match the first player to win 8 games is the winner.
The scatter diagram shows the number of games that Ronnie won in each match and the number of hours that he practised before each match.



(c) Tick the box which best describes the strength and type of correlation shown in the scatter diagram.

Strong negative	Weak negative	No correlation	Weak positive	Strong positive
☐	☐	☐	☐	☐

(1 mark)

(d) Ronnie draws a line of best fit on the scatter diagram.
He uses it to estimate the number of games he would win if he practised for 4.5 hours before a match.

Explain why this is **not** sensible.

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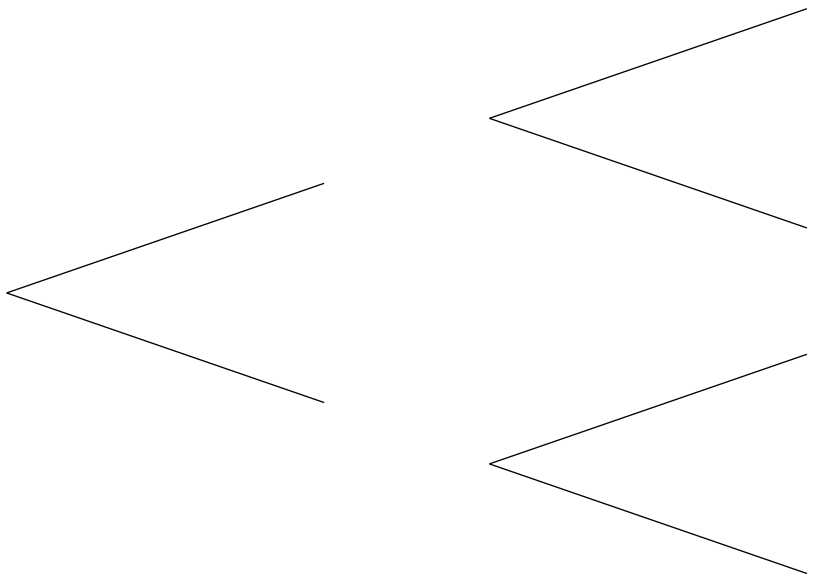
(1 mark)

5

Turn over ▶

2 Weather records are kept in a town called Snowville.
They show that in a typical April it snows on 20 days out of the 30 days in the month.

(a) Complete a fully labelled tree diagram showing the probabilities of it snowing or not snowing on the first two Sundays in April in Snowville.



(4 marks)

(b) Calculate the probability that it snows on only one of these two Sundays.
You **must** show your working.

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

7

3 (a) Explain how you could obtain a random sample of 50 residents from a village.

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(1 mark)

(b) The population of a town is 61 500.
The table below shows the population of the town by age group.

Age group	Under 18	18 to 35	36 to 65	Over 65
Population	12 100	25 300	16 600	7 500

Calculate the number from each age group that would be needed for a stratified sample of size 1000.

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Answer

Under 18	
18 to 35	
36 to 65	
Over 65	

(3 marks)

4

4 Bob has just retired.
He often goes into town and sometimes uses the Internet café in the town.

The probability that Bob goes to town on a Wednesday is $\frac{3}{5}$

The probability that Bob goes to town on a Wednesday **and** uses the Internet café is $\frac{7}{20}$

(a) One Wednesday Bob goes to town.
Calculate the probability that he uses the Internet café.

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

(b) Calculate the probability that Bob does **not** use the Internet café next Wednesday.

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

4

END OF SECTION A

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Surname		Other Names	
Centre Number			Candidate Number				
Candidate Signature									

General Certificate of Secondary Education
March 2006

ASSESSMENT and QUALIFICATIONS ALLIANCE

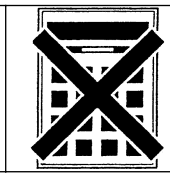
MATHEMATICS (MODULAR) (SPECIFICATION B) 33001/HB
Module 1 Higher Tier Section B

Monday 6 March 2006 2.00 pm to 2.25 pm

H

For this paper you must have:
- 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.
- Answer the questions in the spaces provided.
- Do all rough work in this book.
- 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.
- The marks for questions are shown in brackets.
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer book.

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

LEAVE MARGIN BLANK

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

5 Nadia delivers a questionnaire to every house on her street.
One of the questions on the questionnaire is

"Do you agree that under-16s should not be allowed outdoors after 9 pm?"

(a) (i) Write down **one** criticism of this question.

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(1 mark)

(ii) Explain why Nadia's method of collecting data is **not** suitable.

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(1 mark)

(b) Write a suitable question asking parents what they think is the latest time that under-16s should be indoors.
Include a response section.

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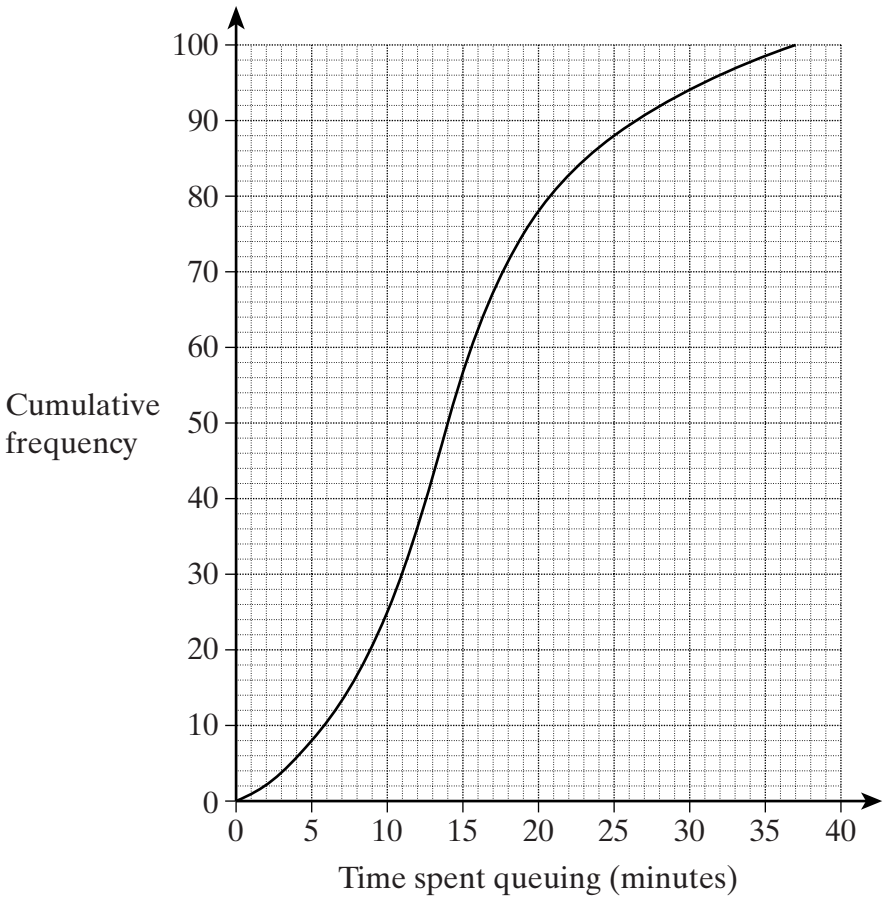
(2 marks)

4

6 The time, in minutes, spent queuing in a post office by each of 100 customers is summarised by the cumulative frequency diagram below.



Use the cumulative frequency diagram to estimate

(a) how many customers queued for more than 25 minutes

.....

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

(b) the median queuing time

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

(c) the interquartile range of the queuing times.

.....

.....

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

5

7 A bag contains twelve numbered counters.
The counters are either red or yellow.
The table shows how the counters are coloured and numbered.

		Number on counter			
		10	**20**	**30**	**40**
Colour	**Red**	1	1	2	3
	Yellow	2	2	0	1

For example there are 3 red counters numbered 40.

A counter is taken at random from the bag and is not replaced.
A second counter is then taken at random from the bag.

Calculate the probability that the two counters taken from the bag have different colours **and** the total of the two numbers is 50.

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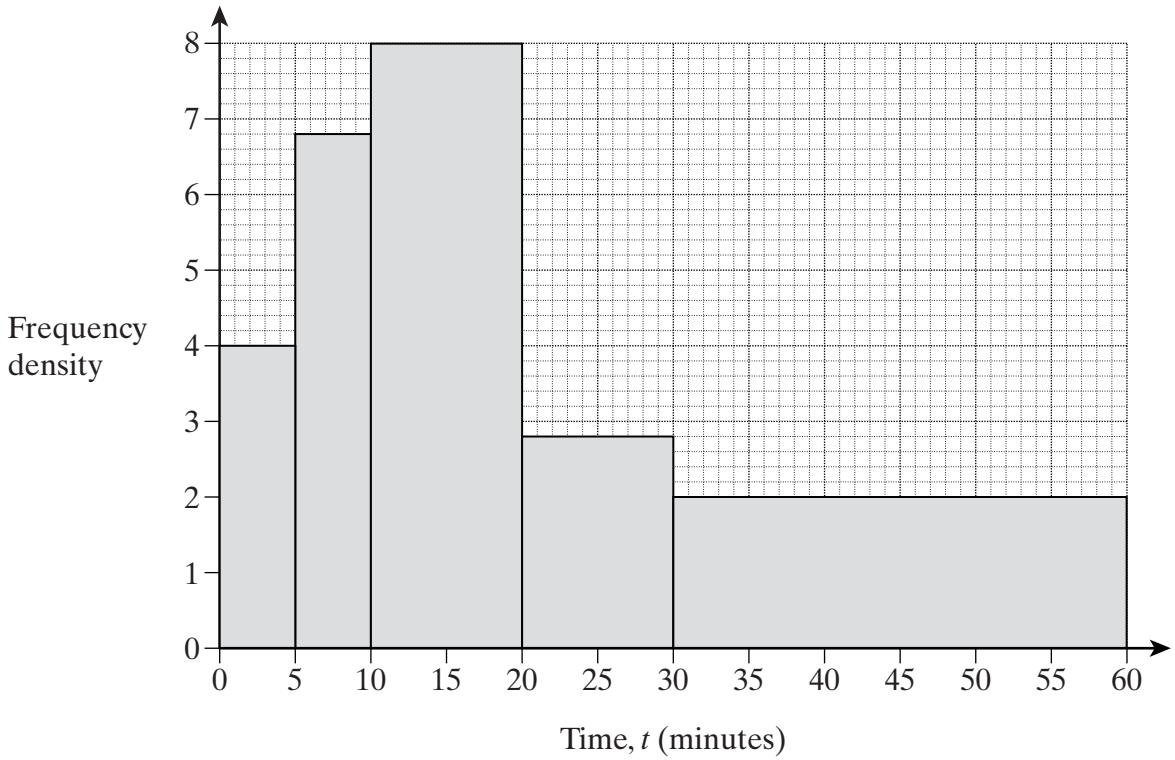
Answer ..... *(5 marks)*

5

8 The histogram summarises the travelling times to school of a sample of pupils.



(a) Complete the frequency table below.

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Time, t (minutes)	$0 < t \leqslant 5$	$5 < t \leqslant 10$	$10 < t \leqslant 20$	$20 < t \leqslant 30$	$30 < t \leqslant 60$
Number of pupils			80		

(3 marks)

(b) One-third of these pupils take more than T minutes to travel to school.

Calculate an estimate of the value of T.

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

END OF QUESTIONS

6

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