Surname		Other Names	
Centre Number			Candidate Number				
Candidate Signature									

Leave blank

General Certificate of Secondary Education
June 2003

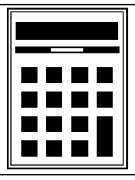
ASSESSMENT and QUALIFICATIONS ALLIANCE

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

Thursday 12 June 2003 1.30 pm to 1.55 pm

H

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



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			

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, make sure that you hand in **both** Section A and Section B securely tagged 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.

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

1 The table shows the times taken by a group of ramblers to complete a five mile walk.

Time, t (minutes)	**Number of ramblers**
$100 \leqslant t < 110$	6
$110 \leqslant t < 130$	7
$130 \leqslant t < 150$	8
$150 \leqslant t < 200$	4

(a) Calculate an estimate of the mean time taken by these ramblers to complete the walk.

.....

.....

.....

.....

.....

.....

.....

.....

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

(b) Which class interval contains the median time of these ramblers?

.....

.....

.....

Answer ..... $\leqslant t <$ ..... *(2 marks)*

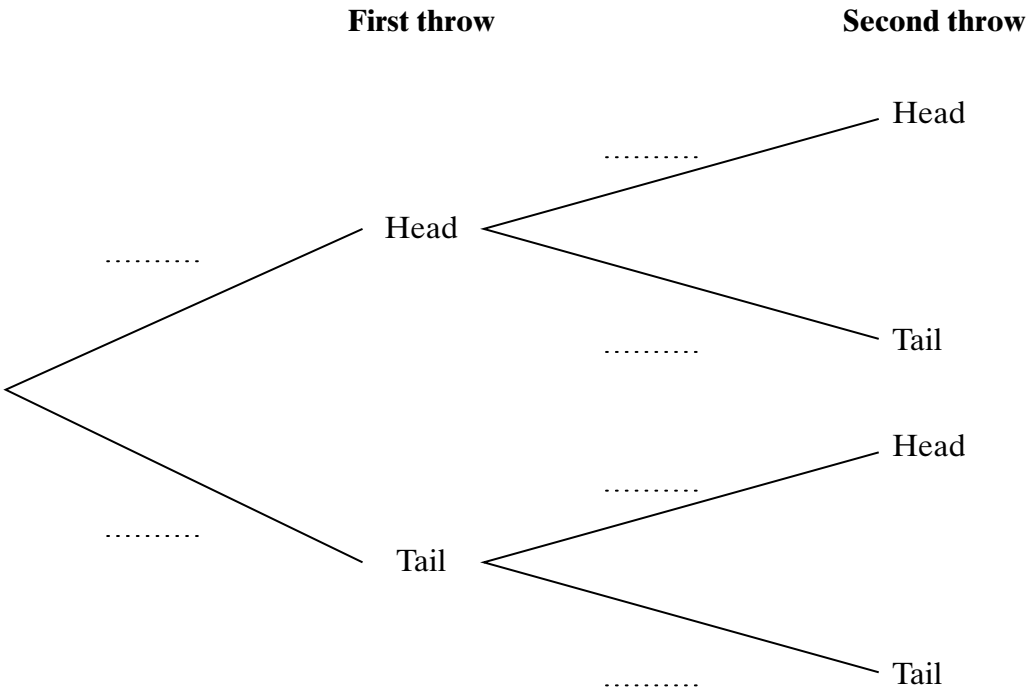
6

2 Danny has a biased coin.

The probability that the coin lands heads is $\frac{2}{3}$.

Danny throws the coin twice.

(a) Fill in the probabilities on the tree diagram.



(2 marks)

(b) Calculate the probability that Danny gets two heads.

.....

.....

.....

.....

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

4

3 A factory has 70 employees.

(a) Explain how you could obtain a random sample of 15 employees from this factory.

.....

.....

.....

.....

(2 marks)

(b) The table shows the number of each type of employee at the factory.

Type of employee	Labourer	Office staff	Management
Number of employees	44	19	7

Calculate the number of each type of employee for a stratified sample of size 15 from the factory.
Show your working.

.....

.....

.....

.....

.....

Answer Labourer .....

Office Staff .....

Management .....

(3 marks)

5

4 A box contains 10 coloured discs numbered 1 to 10.

The discs numbered 1 to 5 are red.
The discs numbered 6 to 9 are blue.
The disc numbered 10 is green.

A disc is taken at random from the box and is **not** replaced.
A second disc is then taken from the box.

Calculate the probability that the two discs are the same colour and the numbers on them add to **more** than 8.

.....

.....

.....

.....

.....

.....

.....

.....

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

5

END OF SECTION A

Surname		Other Names	
Centre Number			Candidate Number				
Candidate Signature									

General Certificate of Secondary Education
June 2003

ASSESSMENT and QUALIFICATIONS ALLIANCE

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

Thursday 12 June 2003 2.00 pm to 2.25 pm

H

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, make sure that you hand in **both** Section A and Section B securely tagged 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.

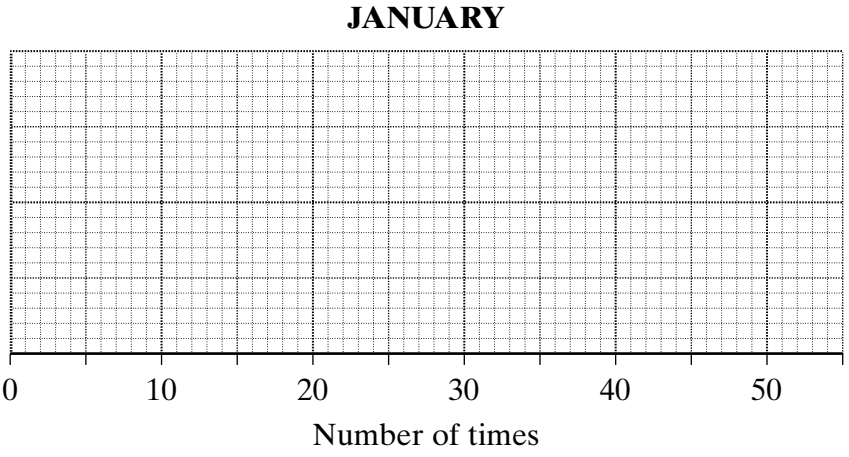
Answer **all** questions in the spaces provided.

5 The manager of a gym recorded the number of times that sun-beds were used each day in January.

The table shows a summary of his results.

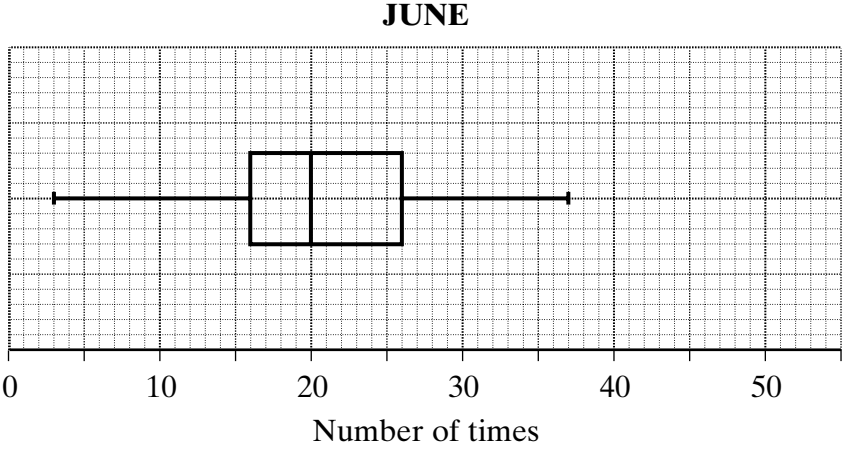
	Number of times
Minimum	16
Lower quartile	23
Median	28
Upper quartile	33
Maximum	40

(a) Draw a box plot to show these results.



(3 marks)

(b) The number of times that the sun-beds were used each day in June is summarized in the box plot below.



Write down **two** differences between the box plots.

.....

.....

.....

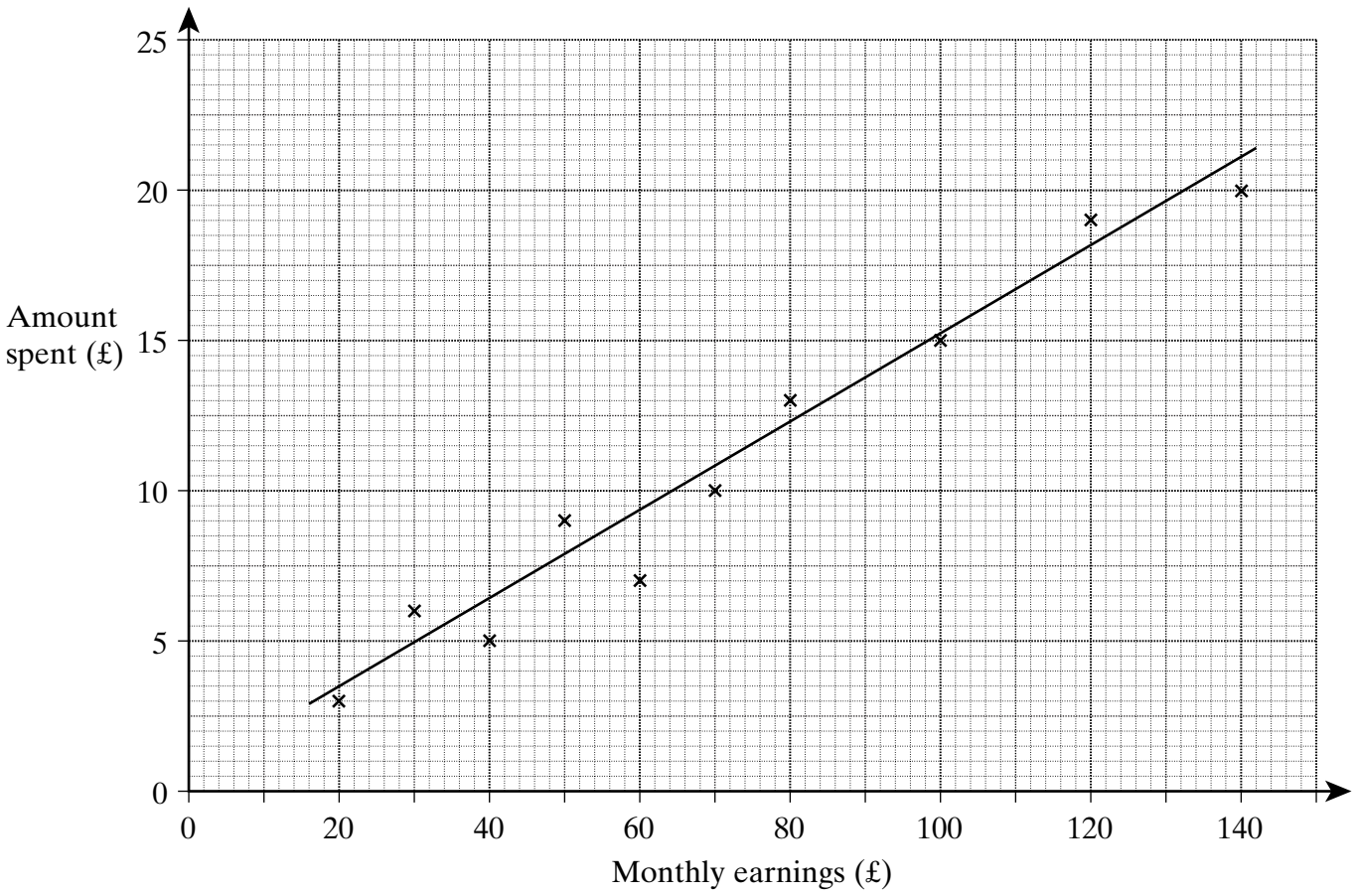
.....

(2 marks)

5

TURN OVER FOR THE NEXT QUESTION

6 The scatter diagram shows the monthly earnings and the amount spent on mobile phone calls by each of ten students last month.



(a) Use the line of best fit to estimate the amount spent on mobile phone calls by a student who earned £112 last month.

Answer £ ..... *(1 mark)*

(b) Explain why it would not be sensible to use the line of best fit to estimate the amount spent on mobile phone calls by a student who earned £400 last month.

.....

.....

.....

.....

(1 mark)

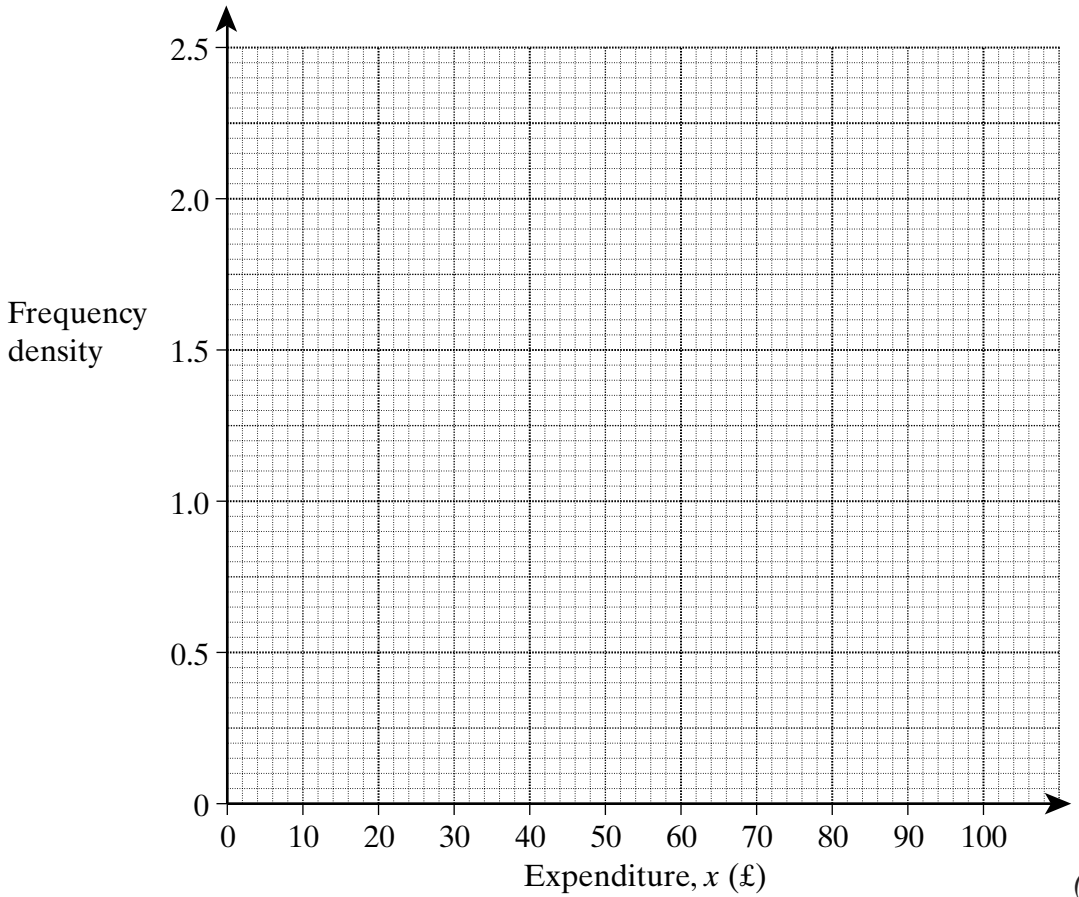
(c) A survey of adults' expenditure on mobile phone calls last month was carried out. The table shows the results.

Expenditure, x (£)	Frequency
$0 \leqslant x < 20$	42
$20 \leqslant x < 40$	20
$40 \leqslant x < 50$	14
$50 \leqslant x < 60$	8
$60 \leqslant x < 100$	16

Draw a histogram for the data.

.....

.....



(3 marks)

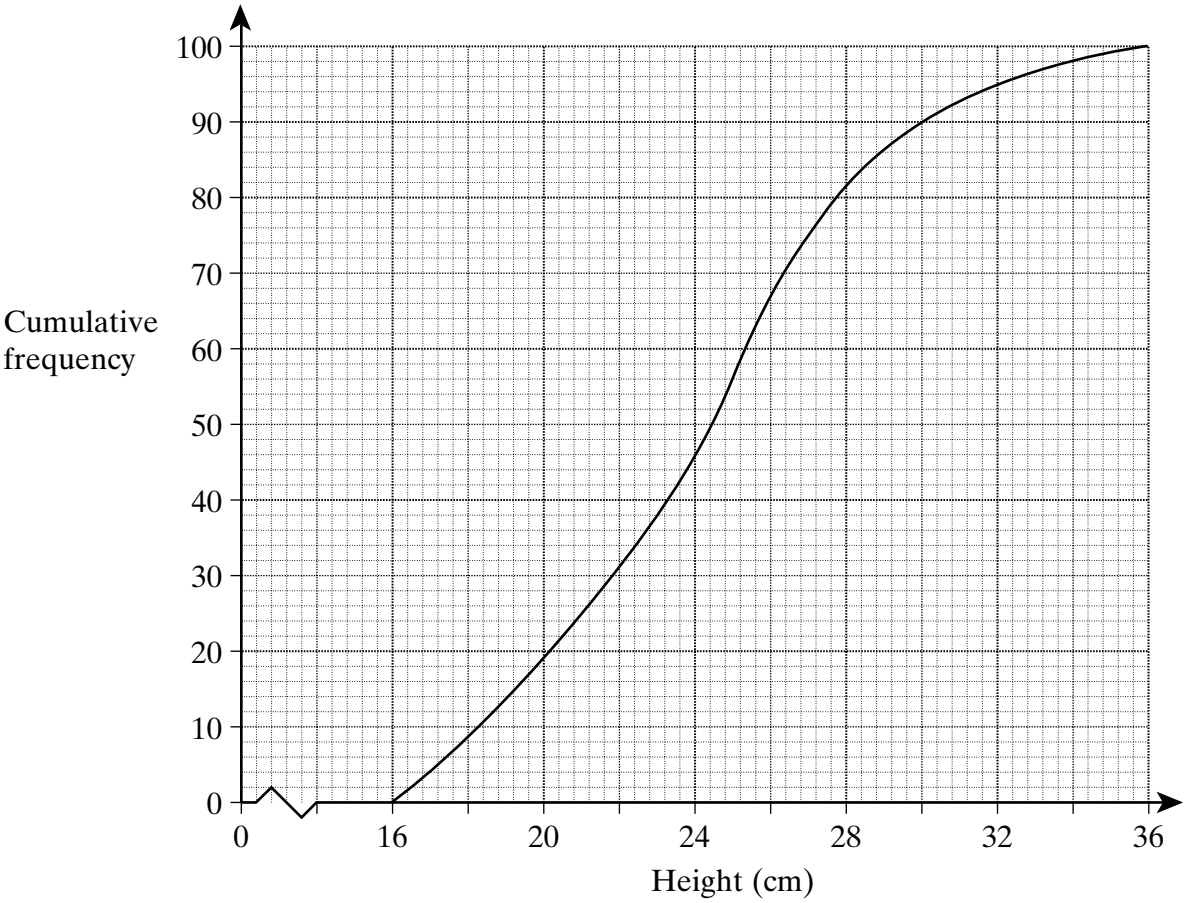
(d) Estimate the number of these adults who spent between £40 and £70 on mobile phone calls last month.

.....

.....

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

7 The cumulative frequency diagram shows the heights, in centimetres, of 100 plants.



Use the cumulative frequency diagram to estimate

(a) the number of plants with a height less than 25 cm,

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

(b) the interquartile range of the heights of the plants.

.....

.....

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

3

8 In a village $\frac{3}{5}$ of the pensioners have had a flu jab.

If a pensioner has had the flu jab the probability of catching flu is $\frac{1}{30}$

If a pensioner has **not** had the flu jab the probability of catching flu is $\frac{7}{10}$

(a) Calculate the probability that a pensioner, picked at random, from this village catches flu.

.....

.....

.....

.....

.....

.....

.....

.....

.....

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

(b) A statistician calculated that 120 pensioners from this village are expected to catch flu.

Calculate how many pensioners live in the village.

.....

.....

.....

.....

.....

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

5

END OF QUESTIONS