Statistics
Difficulty: Hard

Question Paper 5

Level	IGCSE
Subject	Maths (0580/0980)
Exam Board	CIE
Topic	Statistics
Paper	Paper 4
Difficulty	Hard
Booklet	Question Paper 5

Time allowed: **90 minutes**

Score: **/78**

Percentage: **/100**

Grade Boundaries:

CIE IGCSE Maths (0580)

A*	A	B	C	D
>83%	67%	51%	41%	31%

CIE IGCSE Maths (0980)

9	8	7	6	5	4
>95%	87%	80%	69%	58%	46%

(a) Each student in a class is given a bag of sweets.

The students note the number of sweets in their bag.

The results are shown in the table, where $0 \leqslant x < 10$.

Number of sweets	30	31	32
Frequency (number of bags)	10	7	x

(i) State the mode. [1]

(ii) Find the possible values of the median. [3]

(iii) The mean number of sweets is 30.65.

Find the value of x. [3]

(b) The mass, m grams, of each of 200 chocolates is noted and the results are shown in the table.

Mass (m grams)	$10 < m \leqslant 20$	$20 < m \leqslant 22$	$22 < m \leqslant 24$	$24 < m \leqslant 30$
Frequency	35	115	26	24

(i) Calculate an estimate of the mean mass of a chocolate. [4]

(ii) On a histogram, the height of the column for the $20 < m \leqslant 22$ interval is 11.5 cm.

Calculate the heights of the other three columns.

Do not draw the histogram. [5]

(a) The numbers 0, 1, 1, 1, 2, k, m, 6, 9, 9 are in order ($k \neq m$).
Their median is 2.5 and their mean is 3.6.

(i) Write down the mode. [1]
(ii) Find the value of k. [1]
(iii) Find the value of m. [2]
(iv) Maria chooses a number at random from the list.
The probability of choosing this number is $\frac{1}{5}$. Which number does she choose? [1]

(b) 100 students are given a question to answer.
The time taken (t seconds) by each student is recorded and the results are shown in the table.

t	$0<t\leqslant 20$	$20<t\leqslant 30$	$30<t\leqslant 35$	$35<t\leqslant 40$	$40<t\leqslant 50$	$50<t\leqslant 60$	$60<t\leqslant 80$
Frequency	10	10	15	28	22	7	8

(i) Calculate an estimate of the mean time taken. [4]

(ii) Two students are picked at random.
What is the probability that they both took more than 50 seconds? [3]
Give your answer as a fraction in its lowest terms.

Answer part (c) on a sheet of graph paper.

(c) The data in part (b) is re-grouped to give the following table.

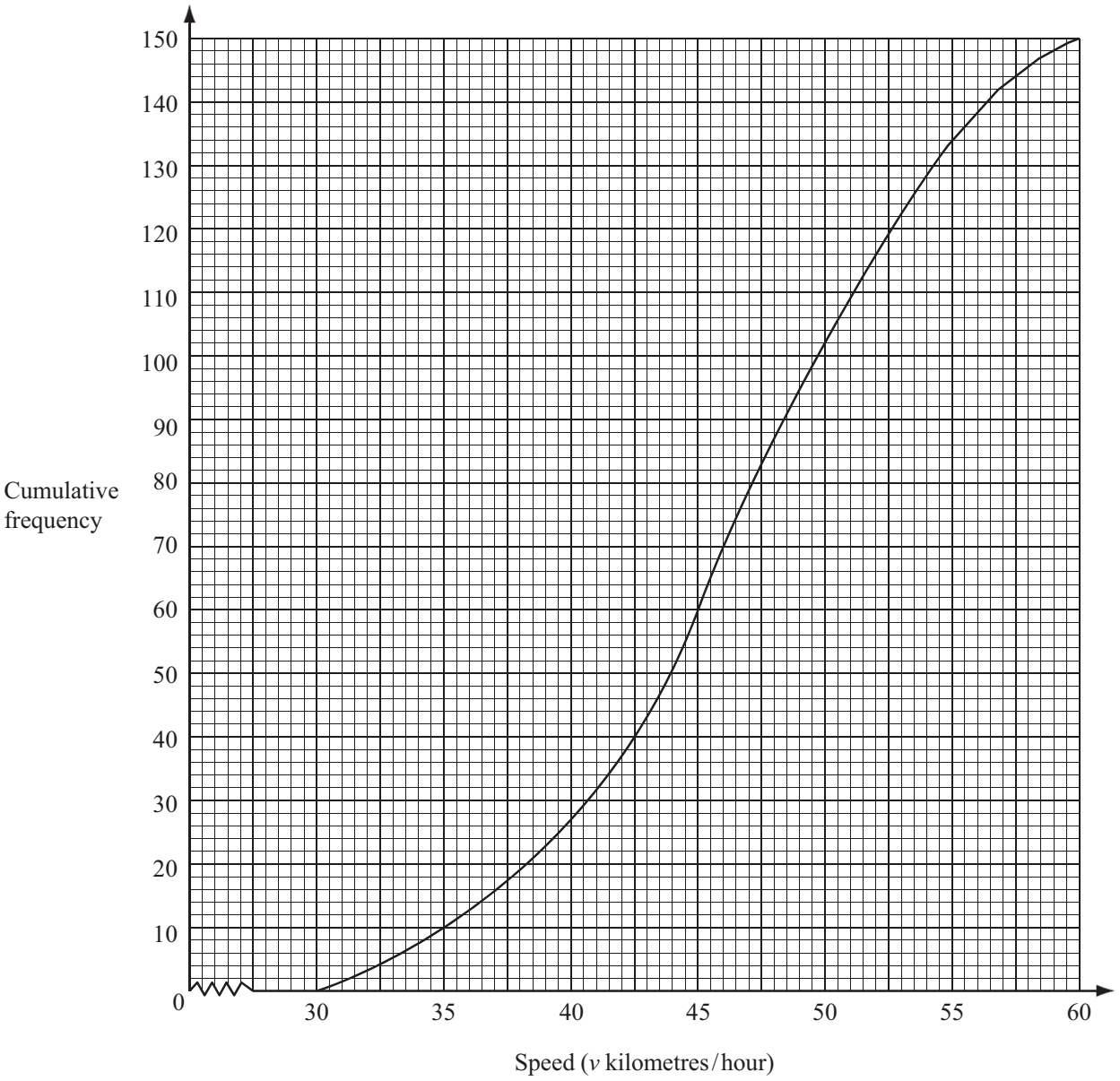
t	$0<t\leqslant 30$	$30<t\leqslant 60$	$60<t\leqslant 80$
Frequency	p	q	8

(i) Write down the values of p and q. [2]

(ii) Draw an accurate histogram to show these results.
Use a scale of 1 cm to represent 5 seconds on the horizontal time axis.
Use a scale of 1 cm to 0.2 units of frequency density (so that 1 cm^2 on your histogram represents 1 student). [4]

3

The speeds (v kilometres/hour) of 150 cars passing a 50 km/h speed limit sign are recorded.
A cumulative frequency curve to show the results is drawn below.



(a) Use the graph to find

(i) the median speed, [1]

(ii) the inter-quartile range of the speeds, [2]

(iii) the number of cars travelling with speeds of more than 50 km/h. [2]

(b) A frequency table showing the speeds of the cars is

Speed (v km/h)	$30<v\leqslant 35$	$35<v\leqslant 40$	$40<v\leqslant 45$	$45<v\leqslant 50$	$50<v\leqslant 55$	$55<v\leqslant 60$
Frequency	10	17	33	42	n	16

(i) Find the value of n. [1]

(ii) Calculate an estimate of the mean speed. [4]

(c) **Answer this part of this question on a sheet of graph paper.**

Another frequency table for the same speeds is

Speed (v km/h)	$30<v\leqslant 40$	$40<v\leqslant 55$	$55<v\leqslant 60$
Frequency	27	107	16

Draw an accurate histogram to show this information.
Use 2 cm to represent 5 units on the speed axis and 1 cm to represent 1 unit on the frequency density axis (so that 1 cm^2 represents 2.5 cars). [5]

Answer the whole of this question on a sheet of graph paper.
120 passengers on an aircraft had their baggage weighed. The results are shown in the table.

Mass of baggage (M kg)	$0 < M \leqslant 10$	$10 < M \leqslant 15$	$15 < M \leqslant 20$	$20 < M \leqslant 25$	$25 < M \leqslant 40$
Number of passengers	12	32	28	24	24

(a) (i) Write down the modal class. [1]

(ii) Calculate an estimate of the mean mass of baggage for the 120 passengers. Show all your working. [4]

(iii) Sophia draws a pie chart to show the data. [1]
What angle should she have in the $0 < M \leq 10$ sector?

(b) Using a scale of 2 cm to represent 5 kg, draw a horizontal axis for $0 < M \leq 40$.
Using an area scale of 1 cm^2 to represent 1 passenger, draw a histogram for this data. [7]

In a survey, 200 shoppers were asked how much they had just spent in a supermarket. The results are shown in the table.

Amount($\$x$)	$0 < x \leqslant 20$	$20 < x \leqslant 40$	$40 < x \leqslant 60$	$60 < x \leqslant 80$	$80 < x \leqslant 100$	$100 < x \leqslant 140$
Number of shoppers	10	32	48	54	36	20

(a) (i) Write down the modal class. [1]

(ii) Calculate an estimate of the mean amount, giving your answer correct to 2 decimal places. [4]

(b) (i) Make a cumulative frequency table for these 200 shoppers. [2]

(ii) Using a scale of 2 cm to represent \$20 on the horizontal axis and 2 cm to represent 20 shoppers on the vertical axis, draw a cumulative frequency diagram for this data. [4]

(c) Use your cumulative frequency diagram to find

(i) the median amount, [1]

(ii) the upper quartile, [1]

(iii) the interquartile range, [1]

(iv) how many shoppers spent at least \$75. [2]