

Diagrams

Question Paper 5

Level	International A Level
Subject	Maths
Exam Board	CIE
Topic	Representation of data
Sub Topic	Diagrams
Booklet	Question Paper 5

Time Allowed: 57 minutes

Score: /47

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

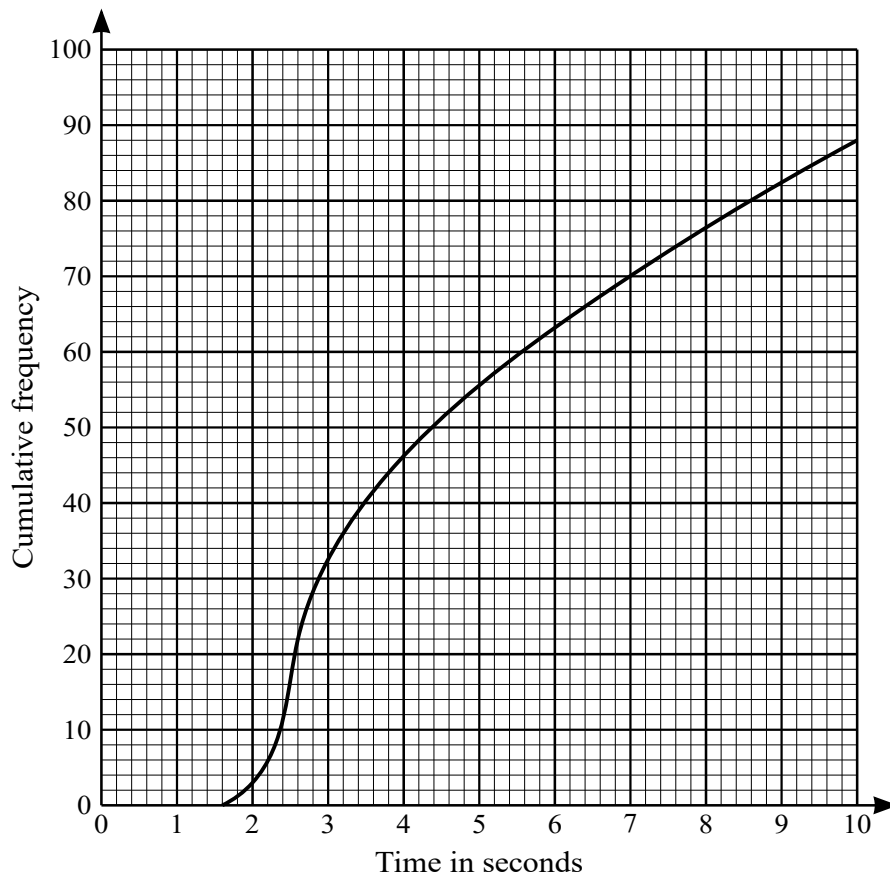
- 1** The table summarises the lengths in centimetres of 104 dragonflies

Length (cm)	2.0 – 3.5	3.5 – 4.5	4.5 – 5.5	5.5 – 7.0	7.0 – 9.0
Frequency	8	25	28	31	12

(i) State which class contains the upper quartile. [1]

(ii) Draw a histogram, on graph paper, to represent the data. [4]

2



In an open-plan office there are 88 computers. The times taken by these 88 computers to access a particular web page are represented in the cumulative frequency diagram.

- (i) On graph paper draw a box-and-whisker plot to summarise this information. [4]

An ‘outlier’ is defined as any data value which is more than 1.5 times the interquartile range above the upper quartile, or more than 1.5 times the interquartile range below the lower quartile.

- (ii) Show that there are no outliers. [2]

- 3 Seventy samples of fertiliser were collected and the nitrogen content was measured for each sample. The cumulative frequency distribution is shown in the table below.

Nitrogen content	≤ 3.5	≤ 3.8	≤ 4.0	≤ 4.2	≤ 4.5	≤ 4.8
Cumulative frequency	0	6	18	41	62	70

- (i) On graph paper draw a cumulative frequency graph to represent the data. [3]
- (ii) Estimate the percentage of samples with a nitrogen content greater than 4.4. [2]
- (iii) Estimate the median. [1]
- (iv) Construct the frequency table for these results and draw a histogram on graph paper. [5]
- 4 A typing test is taken by 111 people. The numbers of typing errors they make in the test are summarised in the table below.

Number of typing errors	1 – 5	6 – 20	21 – 35	36 – 60	61 – 80
Frequency	24	9	21	15	42

- (i) Draw a histogram on graph paper to represent this information. [5]
- (ii) Calculate an estimate of the mean number of typing errors for these 111 people. [3]
- (iii) State which class contains the lower quartile and which class contains the upper quartile. Hence find the least possible value of the interquartile range. [3]

- 5 The times taken by 57 athletes to run 100 metres are summarised in the following cumulative frequency table.

Time (seconds)	<10.0	<10.5	<11.0	<12.0	<12.5	<13.5
Cumulative frequency	0	4	10	40	49	57

- (i) State how many athletes ran 100 metres in a time between 10.5 and 11.0 seconds. [1]
- (ii) Draw a histogram on graph paper to represent the times taken by these athletes to run 100 metres. [4]
- (iii) Calculate estimates of the mean and variance of the times taken by these athletes. [4]
- 6 Some adults and some children each tried to estimate, without using a watch, the number of seconds that had elapsed in a fixed time-interval. Their estimates are shown below.

Adults: 55 58 67 74 63 61 63 71 56 53 54 78 73 64 62
Children: 86 95 89 72 61 84 77 92 81 54 43 68 62 67 83

- (i) Draw a back-to-back stem-and-leaf diagram to represent the data. [3]
- (ii) Make two comparisons between the estimates of the adults and the children. [2]