Diagrams

Question Paper 6

Level	International A Level
Subject	Maths
Exam Board	CIE
Topic	Representation of data
Sub Topic	Diagrams
Booklet	Question Paper 6

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 following back-to-back stem-and-leaf diagram shows the annual salaries of a group of 39 females and 39 males.

	Females										Males										
(4)						5	2	0	0	20	3										(1)
(9)	9	8	8	7	6	4	0	0	0	21	0	0	7								(3)
(8)		8	7	5	3	3	1	0	0	22	0	0	4	5	6	6					(6)
(6)				6	4	2	1	0	0	23	0	0	2	3	3	5	6	7	7		(9)
(6)				7	5	4	0	0	0	24	0	1	1	2	5	5	6	8	8	9	(10)
(4)						9	5	0	0	25	3	4	5	7	7	8	9				(7)
(2)								5	0	26	0	4	6								(3)

Key: 2 | 20 | 3 means \$20 200 for females and \$20 300 for males.

(i) Find the median and the quartiles of the females' salaries. [2]

You are given that the median salary of the males is \$24 000, the lower quartile is \$22 600 and the upper quartile is \$25 300.

(ii) Represent the data by means of a pair of box-and-whisker plots in a single diagram on graph paper. [3]

2 The following are the annual amounts of money spent on clothes, to the nearest \$10, by 27 people.

10	40	60	80	100	130	140	140	140
150	150	150	160	160	160	160	170	180
180	200	210	250	270	280	310	450	570

(i) Construct a stem-and-leaf diagram for the data. [3]

(ii) Find the median and the interquartile range of the data. [3]

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.

(iii) List the outliers. [3]

3 The weights, x kilograms, of 144 people were recorded. The results are summarised in the cumulative frequency table below.

Weight (x kilograms)	$x < 40$	$x < 50$	$x < 60$	$x < 65$	$x < 70$	$x < 90$
Cumulative frequency	0	12	34	64	92	144

(i) On graph paper, draw a cumulative frequency graph to represent these results. [2]

(ii) 64 people weigh more than c kg. Use your graph to find the value of c. [2]

(iii) Calculate estimates of the mean and standard deviation of the weights. [6]

4 The lengths of the diagonals in metres of the 9 most popular flat screen TVs and the 9 most popular conventional TVs are shown below.

Flat screen :	0.85	0.94	0.91	0.96	1.04	0.89	1.07	0.92	0.76
Conventional :	0.69	0.65	0.85	0.77	0.74	0.67	0.71	0.86	0.75

(i) Represent this information on a back-to-back stem-and-leaf diagram. [4]

(ii) Find the median and the interquartile range of the lengths of the diagonals of the 9 conventional TVs. [3]

(iii) Find the mean and standard deviation of the lengths of the diagonals of the 9 flat screen TVs. [2]

5 Ashfaq and Kuljit have done a school statistics project on the prices of a particular model of headphones for MP3 players. Ashfaq collected prices from 21 shops. Kuljit used the internet to collect prices from 163 websites.

(i) Name a suitable statistical diagram for Ashfaq to represent his data, together with a reason for choosing this particular diagram. [2]

(ii) Name a suitable statistical diagram for Kuljit to represent her data, together with a reason for choosing this particular diagram. [2]

6 There are 5000 schools in a certain country. The cumulative frequency table shows the number of pupils in a school and the corresponding number of schools.

Number of pupils in a school	$\leqslant 100$	$\leqslant 150$	$\leqslant 200$	$\leqslant 250$	$\leqslant 350$	$\leqslant 450$	$\leqslant 600$
Cumulative frequency	200	800	1600	2100	4100	4700	5000

(i) Draw a cumulative frequency graph with a scale of 2 cm to 100 pupils on the horizontal axis and a scale of 2 cm to 1000 schools on the vertical axis. Use your graph to estimate the median number of pupils in a school. [3]

(ii) 80% of the schools have more than n pupils. Estimate the value of n correct to the nearest ten. [2]

(iii) Find how many schools have between 201 and 250 (inclusive) pupils. [1]

(iv) Calculate an estimate of the mean number of pupils per school. [4]