

Q1. a) Consider the following frequency distribution of daily expenditure of 100 UIU students.

Expenditure (BDT)	0-100	100-200	200-300	300-400	400-500
No of students	9	19	34	27	11

- (i). Sketch the Histogram
- (ii). Find the mean and Median (using cumulative frequency graph)
- (iii). Estimate the Standard deviation.

b) For a distribution the following measures are summarized, state the nature of the distribution.

Mean = 30.8, Median = 30.35, and Mode = 32.7

Q2. a) Discuss the strength of correlation from the following Pearson' correlation coefficient.

(i) $r = 0.15$ (ii) $r = -1$

b) The years of experience (x) and the annual turnover (\$ y) are presented in the following table.

Years of experience	x	3	4	5	6	9	10
Sales Volume in thousand \$	y	80	94	102	105	115	123

- (i). Using the above set of data calculate the value of r (coefficient of correlation) and interpret the result
- (ii). Find the regression line in the form $y = a + bx$.
- (iii). Verify your model found in question (ii) with the tabular value for 6 years' experience.
- (iv). Predict the annual sales turnover for a person with 12 years' experience.

Q3

Ten candidates were ranked as follows by two independent examiners, according to the score they obtained in an interview.

Candidate Number	1	2	3	4	5	6	7	8	9	10
Ranked by Ex. 1	7	9	1	3	8	4	10	5	6	2
Ranked by Ex. 2	9	5	1	4	6	7	8	2	10	3

Calculate the Spearman's rank correlation Coefficient and interpret the result.

Q4

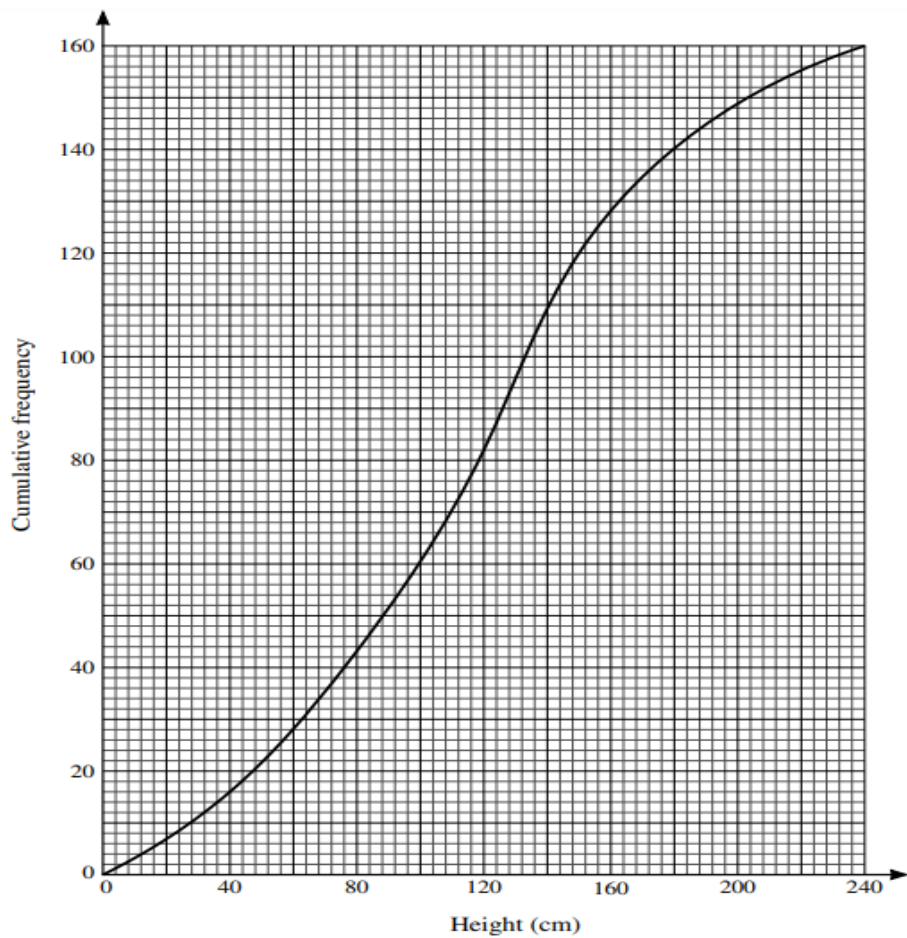
The annual salaries in thousands of dollars, for 11 employees at each of the two companies A and B are shown below.

Company A	30	32	35	41	41	42	47	49	52	53	64
Company B	26	47	30	52	41	38	35	42	49	31	42

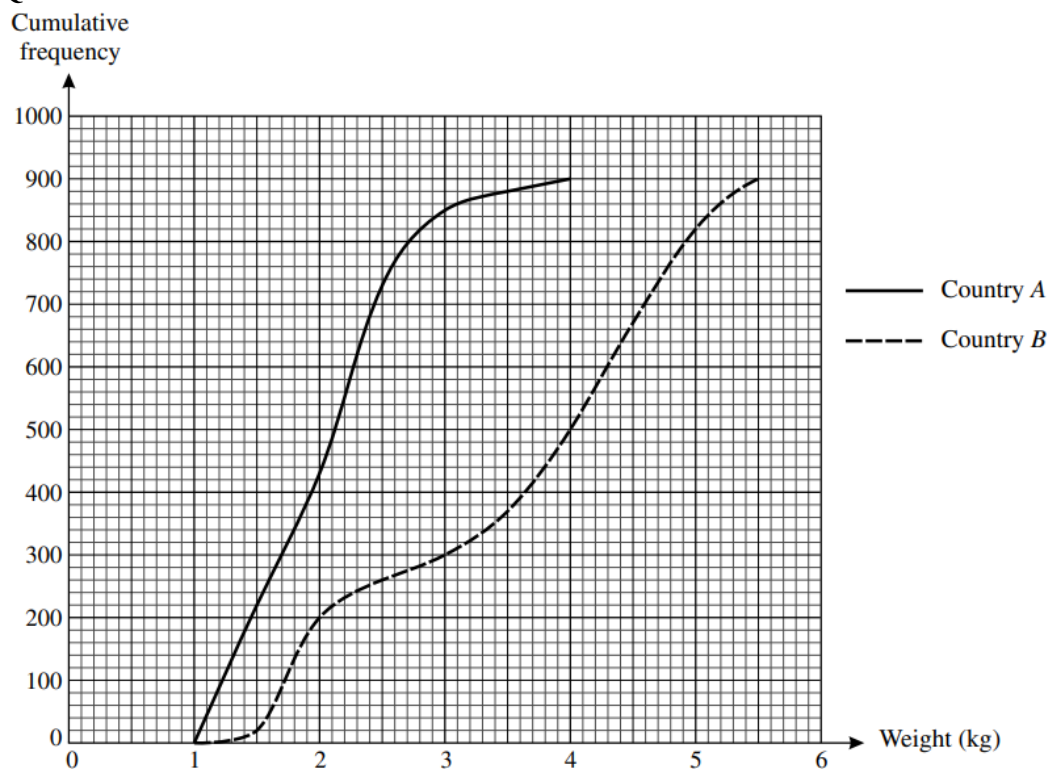
Represent the data by drawing back-to-back Box and Whisker plot on the same axis and then compare their distribution.

5 The heights in cm of 160 sunflower plants were measured. The results are summarized on the following cumulative frequency curve.

- (a) Use the graph to estimate the range of the plants' heights.
- (b) Use the graph to estimate the number of plants with heights less than 100 cm.
- (c) Use the graph to estimate the 4th decile of the distribution.
- (d) Use the graph to estimate the median and interquartile range of the heights of these plants.
- (e) Use the graph to estimate what percentage of the plants' height lies between 40 cm to 60 cm.



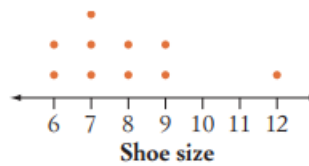
Q6



The birth weights of random samples of 900 babies born in country A and 900 babies born in country B are illustrated in the cumulative frequency graphs. Use suitable data from these graphs to compare the central tendency and spread of the birth weights of the two sets of babies.

Q7

The dot plot on the right shows the shoe sizes of a sample of Year 11 students.



- a** For this data, find:
- the mean
 - the median
 - the mode.
- b** If the outlier is removed, state what will happen to:
- the mean
 - the mode.
- c** A shoe store needs to buy more shoes for a back-to-school sale. Which measure of location is the most appropriate for the store to use in this situation?

Q8

The stem-and-leaf plot on the right shows the maximum daily temperatures (in °C) in Port Macquarie for the last two weeks in December.

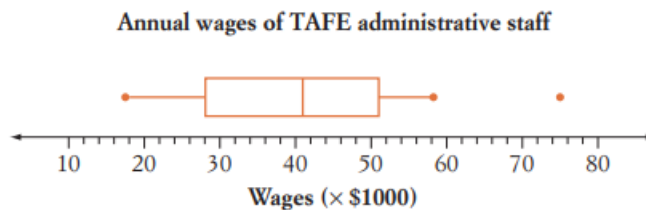
Stem	Leaf
2	2 4 4 5 6 6 7 7 7 8 8 9
3	1 4

Source: Bureau of Meteorology

- a** For this data, find:
- the mean
 - the median
 - the mode.
- b** Which measure of location is the most appropriate for describing the average maximum daily temperature?

Q8

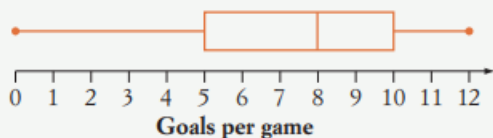
This box-and-whisker plot represents the annual wages (× \$1000) of the administration staff at a TAFE college.



- a** One of the wages is an outlier which was not included in the box-and-whisker plot. What is the outlier?
- b** What is the median wage?
- c** Excluding the outlier, what is the range of wages?
- d** Including the outlier, what is the range of wages?
- e** Between what two amounts are the middle 50% of staff wages?
- f** What percentage of the staff earn less than \$28 000?

Q9

This box-and-whisker plot represents the number of goals scored per game by a hockey team over a season.



- a** What was the lowest score?
- b** Find the interquartile range.
- c** In what fraction of games were over 8 goals scored?
- d** In what percentage of games were less than 5 goals scored?

Q10

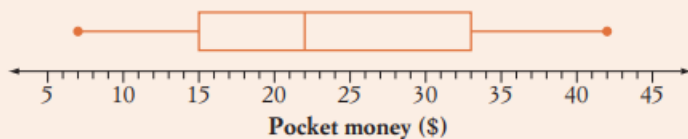
The ages of 10 people at a park were:

21 13 64 75 35 83 7 71 18 29

- a** Find a five-number summary for this data.
- b** Represent this data on a box-and-whisker plot.

Q11

This box-and-whisker plot represents the amount of pocket money in dollars earned by a sample of 48 children.



- a** Find the median.
- b** Find the range.
- c** How many children earned between:
 - i** \$33 and \$42?
 - ii** \$15 and \$42?
- d** Find the interquartile range.