

**Section A: Multiple Choice [5]**

**Q1** In a set of data there is one score which is extremely small when compared to all the others. This outlying value is most likely to

- (A) have the greatest effect on the mean of the data
- (B) have the greatest effect on the median of the data
- (C) have the greatest effect on the mode of the data
- (D) have a great effect on mean, median and mode.
- (E) have little effect on mean, median and mode.

( )

**Q2** The interquartile range is considered to be a better measure of the spread of a set of scores than the range because

- (A) it takes into account more scores
- (B) it is the difference between the upper and lower quartiles
- (C) it is easier to calculate
- (D) it is centred around the median
- (E) it is not affected by extreme values.

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**Q3** The median of a set of data is the 13<sup>th</sup> score. The position of the lower quartile will be

- (A) the 6<sup>th</sup> score
- (B) the 7<sup>th</sup> score
- (C) the 6.5 score
- (D) the 19<sup>th</sup> score
- (E) indeterminable without seeing the data itself.

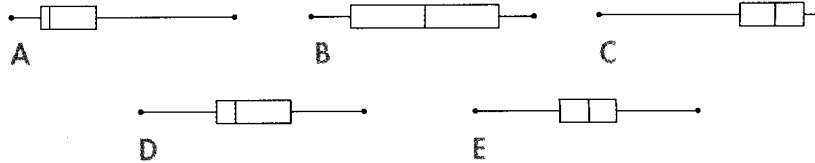
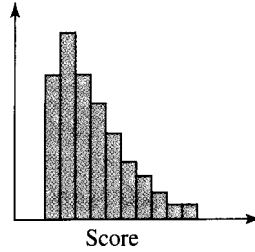
( )

**Q4** Which of the following is not generally affected by the inclusion of an extreme value in a set of data?

- (A) The range
- (B) The mean
- (C) The interquartile range
- (D) The standard deviation
- (E) The variance

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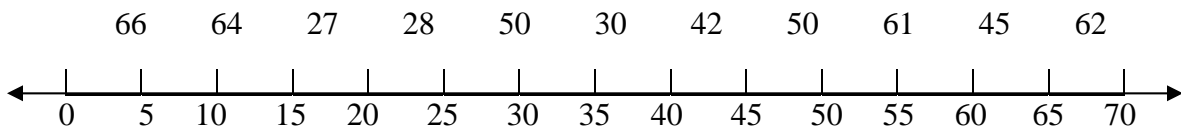
**Q5** Which of the following boxplots would best represent the data shown in this histogram?



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**Section B: Structured Questions.** All diagrams to be drawn using PENCIL and RULER.

**Q6** Using the scale given, sketch a box and whisker plot for the given data. [3]



**Q7** John's Economics Teacher lost his grade book, which contained John's five test scores for the course. A summary of the scores (each of which was an integer from 0 to 100) indicates that the mean was 88, the median was 87, and the mode was 92. (The data set is not bimodal.)

Showing your working clearly, determine the lowest possible number among the missing scores. [3]

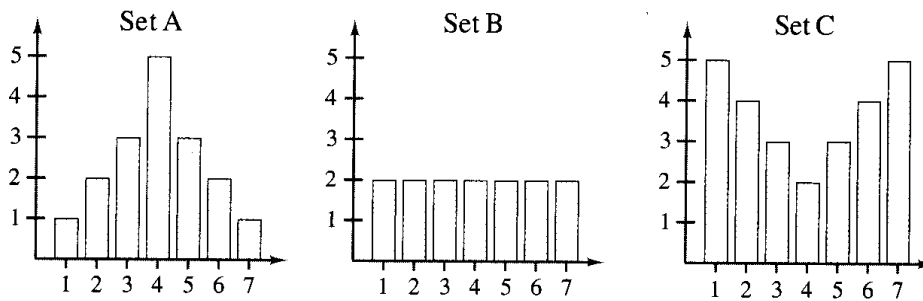
**Q8** A and B are two brands of potato chips. Each is sold in packets of the same size and for the same price. Upon investigation of a sample of packets of each, it is found that A and B have the same mean weight (30g). The standard deviation of the weights of packets of A is 5g and the standard deviation of the weights of packets of B is 2g. Which brand do you think would represent the best value for money under these circumstances? Explain your answer. [2]

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**Q9** Consider the three sets of data represented by the bar graphs. Which set has the smallest standard deviation and why? [3]




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**Q10** A new drug for the relief of cold symptoms has been developed. To test the drug, 40 people were exposed to a cold virus.

20 patients were then given a dose of the drug while another 20 patients were given placebo. (in medical tests a control group is often given a ‘placebo’ drug. The patients in this group believe that they have been given the real drug but in fact their dose contains no drug at all.)

All participants were then asked to indicate the time when they first felt relief of symptoms. The number of hours from the time the dose was administered to the time when the patients first felt relief of symptoms are detailed below.

Group A (given drug)

25 29 32 45 18 21 37 42 62 13  
42 38 44 42 35 47 62 17 34 32

Group B (given placebo)

25 17 35 42 35 28 20 32 38 35  
34 32 25 18 22 28 21 24 32 36

- (a) Display the data on a back-to-back stem-and-leaf plot. [3]  
(b) Does the drug work? Justify your answer. [2]

**Q11** The weights of 800 fish in a fish pond A were sampled and given in the table below.

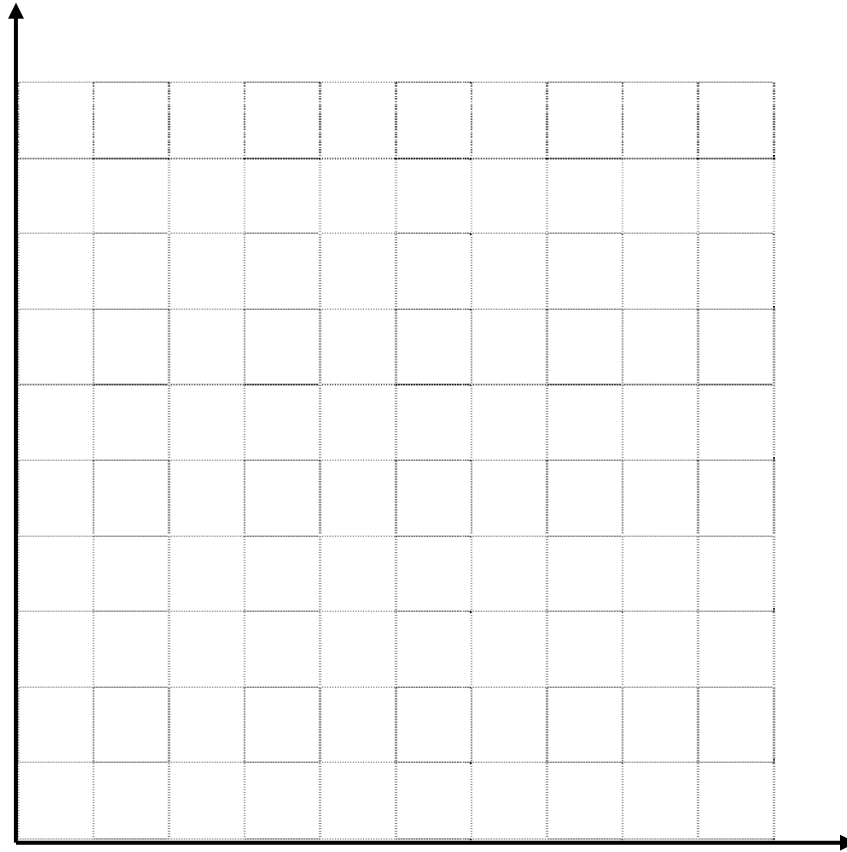
Weight ( $w$ grams)	No. of Fish
$0 < w \leq 100$	48
$100 < w \leq 200$	80
$200 < w \leq 300$	145
$300 < w \leq 400$	251
$400 < w \leq 500$	151
$500 < w \leq 600$	79
$600 < w \leq 700$	36
$700 < w \leq 800$	10

The frequency distribution for the weights of fish in the pond is given in the cumulative frequency table below. Complete the table. [2]

Weight ( $w$ grams)	$w \leq 100$	$w \leq 200$	$w \leq 300$	$w \leq 400$	$w \leq 500$	$w \leq 600$	$w \leq 700$	$w \leq 800$
No. of Fish								

- (a) Use a scale of 1 cm to represent 100 units on both axes, draw a smooth cumulative frequency curve, and label the curve “A” to illustrate this information. The axes have been drawn for you. [3]
- (b) Use your graph to estimate the interquartile range. [2]
- (c) If the farmer intends to sell the heaviest 30% of the fish, estimate the least weight of the fish to be sold. [1]
- (d) A second fish pond B, also has a population of 800 fish. For this population the median weight is 500 grams, the lower quartile is 400 grams, the interquartile range is 200 grams, the weight of the heaviest fish is 800 grams.
- (i) On the same axes, draw and label clearly the cumulative frequency curve “B” to illustrate the information. [2]
- (ii) State, with reason, which fish pond you would buy the fish from, assuming you prefer bigger fish. [2]

**Q11(a)**



**Q12** The test scores of a class of 10 students are given below:

73	68
86	73
88	84
78	71
88	76

- (a) Calculate the mean score of the class. [2]  
(b) Calculate the standard deviation of the class. [5]

Show your working clearly.