Student Name: _____

GENERAL MATHEMATICS 2024

Unit 3
Key Topic Test 1 – Data Analysis Investigating Data Distributions

Recommended writing time: 45 minutes
Total number of marks available: 25 marks

QUESTION BOOK

* The recommended writing time is a guide to the time students should take to complete this test. Teachers may wish to alter this time and can do so at their own discretion.

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Conditions and restrictions

- Students are permitted to bring into the room for this test: pens, pencils, highlighters, erasers, sharpeners and rulers, approved CAS calculator and one bound reference book.
- Students are NOT permitted to bring into the room for this test: blank sheets of paper and/or white out liquid/tape.

Materials supplied

- Question and answer book of 8 pages.

Instructions

- Print your name in the space provided on the top of the front page.
- All written responses must be in English.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic communication devices into the room for this test.

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SECTION A – Multiple-choice questions

Instructions for Section A

- All questions are worth one mark.
- Answer all questions by circling the correct response.
- Marks are not deducted for incorrect answers.
- No marks will be awarded if more than one answer is completed for any question

Use the following information to answer Questions 1 and 2

The stem plot below shows the distribution of length (in cm) of various indoor plants in a room.

key: 1|2 = 12 $n = 15$

0	5 6
1	0 1 3
2	3 3 4 5
3	2 5 6
4	9
5	0 0

Question 1
The percentage of plants with a height less than 24 cm is closest to:

A. 45

B. 47

C. 50

D. 53

E. 25

Question 2
The upper fence for outliers is

A. 25

B. 36

C. 73

D. 73.5

E. 61

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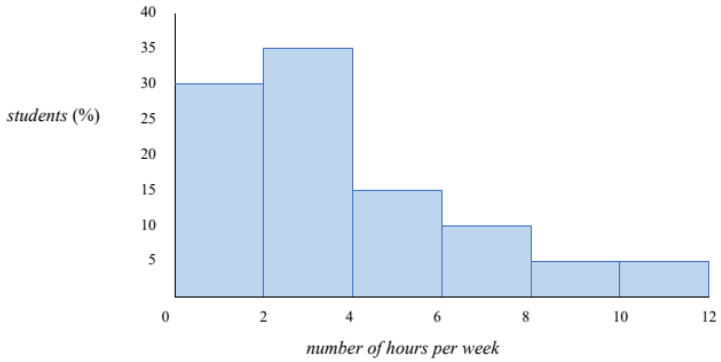
Use the following information to answer Questions 3 and 4

The histogram below shows the number of hours per week of gaming time for students in year 12.



Question 3
The mean number of hours per week of gaming time is best approximated as:

A. 2

B. 3

C. 3.5

D. 3.8

E. 4

Question 4
If there are 250 students in a year level, the number that would spend between 2 and 8 hours per week gaming is:

A. 60

B. 140

C. 150

D. 160

E. 170

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Question 5
The results of the high jump event at a local high school were normally distributed with a mean of 1.2 metres and standard deviation of 20 cm.

The percentage of students expected to jump over 1.4 m is:

A. 34%

B. 5%

C. 16%

D. 2.5%

E. 68%

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SECTION B - Short-answer questions

Instructions for Section B

- Answer each question in the space provided.
- Please provide appropriate workings and use exact answers unless otherwise specified.

Question 1 (7 marks)

A group of 20 people underwent a fitness bootcamp prior to summer. The amount of weight lost by each person is shown in the stem plot below.

Weight loss (kgs) key 2|3 = 23

0	5, 6, 8, 9, 9
1	0, 1, 2, 2, 3, 4, 4, 4
1	5, 6, 8, 9
2	2
2	5
3	0

a. Find the percentage of people that lost more than 15 kg.

_____

_____

1 mark

b. Describe the shape of the distribution.

_____

1 mark

c. Determine the mean weight loss. Round your answer to 1 decimal place.

_____

1 mark

d. Determine the standard deviation for weight loss. Round your answer to 2 decimal places.

_____

1 mark

e. Determine the mode for weight loss.

_____

1 mark

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f. Is the weight loss of 30 kg an outlier for this group? Justify your answer by finding the upper fence for outliers.

_____

_____

_____

2 marks

1 + 1 + 1 + 1 + 1 + 2 = 7 marks

Question 2 (7 marks)

The results of the 100 m sprint at the NSW state athletics competition were normally distributed with a mean of 11.2 seconds and standard deviation of 0.3 seconds.

a. What percentage of runners ran less than 11.2 seconds?

_____

1 mark

b. What percentage of runners ran between 10.9 and 11.5 seconds?

_____

1 mark

c. What percentage of runners ran between 10.6 and 12.1 seconds?

_____

1 mark

At the Victorian state athletics competition the mean time for the 100 m sprint was 10.8 seconds. 2.5% of runners were slower than 11.2 seconds.

d. Find the standard deviation for this competition.

_____

_____

2 marks

e. What percentage of Victorian competitors ran faster than 97.5% of NSW runners?

_____

_____

2 marks

1 + 1 + 1 + 2 + 2 = 7 marks

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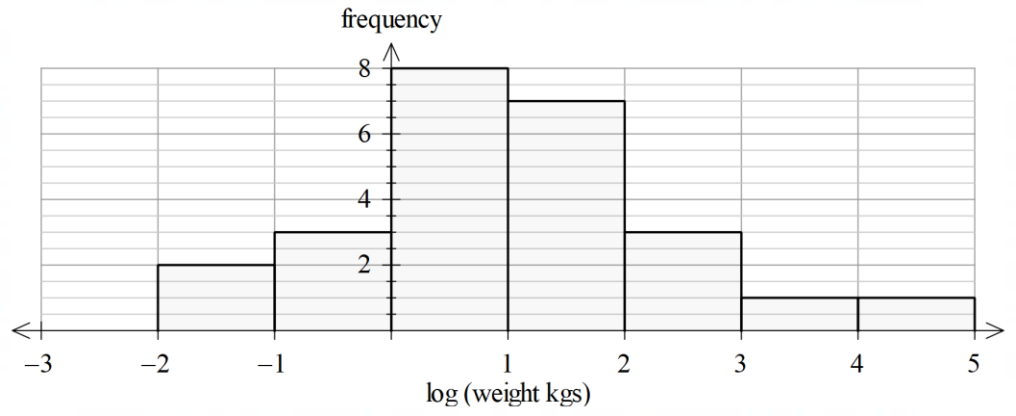
Question 3 (6 marks)

The log of the weight of 25 animal species found on an island are shown in the histogram below.



a. What percentage of animal species had a weight of less than 100 grams?

_____

_____

2 marks

b. Find the median weight group interval in kg.

_____

_____

2 marks

c. The weight of an amphibious species found on the island was 2.4 kg. Determine the log of its weight correct to 2 significant figures.

_____

1 mark

d. The log of the weight of another species was found to be 2.5. Find the weight of this species correct to the nearest kg.

_____

1 mark

2 + 2 + 1 + 1 = 6 marks

END OF KEY TOPIC TEST

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