

## UNIT 17 Measures of Central Tendency

## CSEC Revision Test

1. Boxes of eggs containing broken eggs cannot be sold in shops.

The table shows how many boxes of Grade *A* eggs and Grade *B* eggs could not be sold in a week at one shop.

Grade	Mon	Tue	Wed	Thur	Fri
<i>A</i>	14	16	16	14	16
<i>B</i>	14	12	9	11	15

- (a) For the Grade *A* eggs calculate:
- the range;
  - the mean. (3 marks)
- (b) For the Grade *B* eggs the range is 6 boxes and the mean is 12.2 boxes.  
Use this information to compare the two Grades.  
Which Grade would you recommend the shopkeeper to stock?  
Give a reason. (2 marks)

2. The data shown below are the maximum temperatures recorded, in degree Celsius, on 25 consecutive days in one of the Caribbean Islands.

27	30	28	27	29
30	28	32	31	32
31	32	29	27	30
32	31	28	32	28
28	29	32	30	30

- (i) Copy and complete the following frequency table:

Max. Temperature °C	27	28	29	30	31	32
Frequency (number of days)						

- (3 marks)
- Using the frequency table draw a histogram to illustrate the data. (4 marks)
  - Calculate the mean temperature. (2 marks)
  - Estimate the median temperature. (2 marks)
  - State the modal temperature. (1 mark)
  - Which of the THREE averages seems BEST to describe the temperature for the 25 days?  
Give a reason for your answer. (1 mark)  
(CXC)

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3. Two classes, each with 21 students were given a physical fitness test.

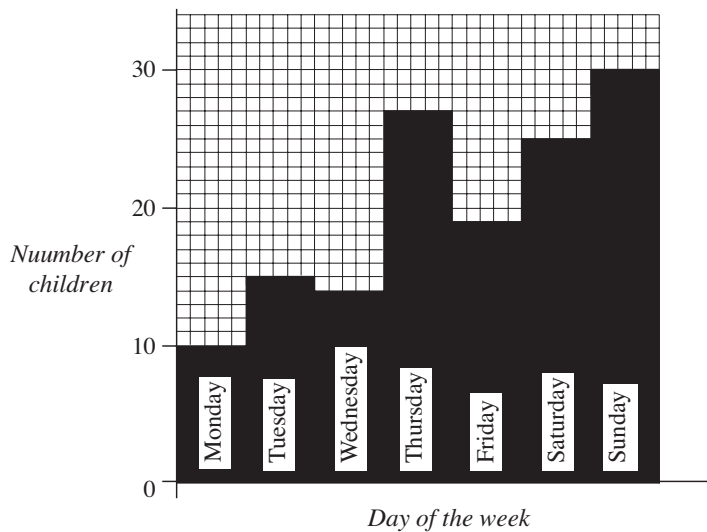
The results of the number of pull-ups performed in 30 seconds were recorded in the tables below:

Class A	No. of pull-ups	5 and under	6	7	8	9	10 and over
	No. of students	3	4	4	7	2	1

Class B	No. of pull-ups	5 and under	6	7	8	9	10 and over
	No. of students	3	7	4	4	2	1

- (a) Can you calculate the mean number of pull-ups performed by the students in each class? Why?
- (b) Find the median number of pull-ups for the students in each class.
- (c) Which would you use, the median or the mode, to compare the results of the two classes? (5 marks)

4.



The diagram shows the number of children who played on the swings in a park during one week

- (a) (i) How many children played on the swings on Wednesday?
- (ii) What was the total number of children who played on the swings in the week?
- (iii) Work out the mean number of children per day who played on the swings. (5 marks)

In the same week the number of children who used the slide was noted.

The most popular day for the slide was Friday when 34 children used it.

The range over the week was 20 children. Tuesday was the least popular day.

- (b) How many children used the slide on Tuesday? (2 marks)
- (c) The mean number of children per day who used the slide was 18.  
Which was more popular, the swings or the slide? Give a reason for your answer. (1 mark)

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5. At the end of a typing course all the students are tested. The time taken to type 60 words is recorded.

The table shows the distribution of their times.

<i>Time</i> ( <i>w</i> seconds)	<i>Number of students</i>
$0 \leq w < 20$	0
$20 \leq w < 40$	7
$40 \leq w < 60$	19
$60 \leq w < 80$	11
$80 \leq w < 100$	3

- (a) Draw a frequency polygon for these data. (2 marks)
- (b) Calculate an estimate of the mean of their times. (3 marks)
6. The height, in centimetres, of seedlings were recorded and grouped as shown below.

<b>Height (cm)</b>	3 - 7	8 - 12	13 - 17	18 - 22	23 - 27
<b>Number of Seedlings</b>	5	16	23	12	4

- (a) Calculate
- (i) the TOTAL number of seedlings in the sample.
- (ii) an estimate of the mean height of the seedlings in the sample. (5 marks)
- (b) Using a scale of 2 cm to represent a height of 5 cm on the *x*-axis, and 2 cm to represent 5 seedlings on the *y*-axis, draw on graph paper the frequency polygon to represent the data given in the table. (5 marks)
- (c) Calculate the probability that a seedling, selected at random, measures at most 12 cm in height. (2 marks)  
(CXC)

7. Monthly rainfall (millimetres)

	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>June</i>	<i>July</i>	<i>Aug</i>	<i>Sept</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>
<i>Great Britain</i>	74	44	40	48	50	29	48	37	61	75	84	70
<i>The Gambia</i>	0	0	0	0	1	2	84	352	185	81	27	0

- (a) The mean rainfall per month in Great Britain is 55 mm.  
Calculate the mean rainfall per month in The Gambia. (3 marks)
- (b) Find the range of the monthly rainfall
- (i) in The Gambia,
- (ii) in Great Britain. (3 marks)

# UNIT 17 *Measures of Central Tendency*

# CSEC Revision Test

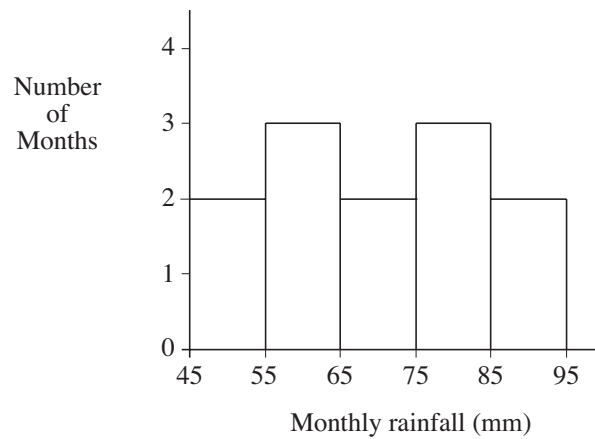
- (c) In which of these two countries are water shortages more likely? (1 mark)
- (d) Explain your answer to part (c), using the means **and** the ranges. (2 marks)
- (e) Monthly rainfall (millimetres)

	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>June</i>	<i>July</i>	<i>Aug</i>	<i>Sept</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>
<i>Geneva</i>	48	46	56	64	76	79	74	91	90	71	79	

The table above shows the monthly rainfall figures for Geneva.

The figure for December is missing

The diagram below represents the figures for all 12 months.



According to this diagram, in which class interval does the December rainfall lie? (2 marks)

**TOTAL MARKS: 59**

# UNIT 17 Measures of Central Tendency

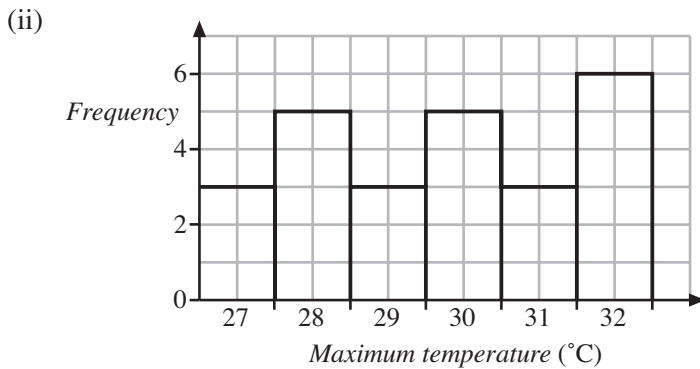
# CSEC Revision Test ANSWERS

1. (a) (i)  $16 - 14 = 2$  B1  
 (ii)  $\text{mean} = \frac{76}{5} = 15.2$  M1 A1  
 (b) Grade B has greater range but lower mean - hence choose A. B1 B1 (5 marks)

2. (i)

Max. Temperature °C	27	28	29	30	31	32
Frequency (number of days)	3	5	3	5	3	6

(-1 for each mistake) B3



(-1 for each mistake) B4

(iii)  $\text{Mean} = \frac{(27 \times 3 + 28 \times 5 + 29 \times 3 + 30 \times 5 + 31 \times 3 + 32 \times 6)}{25}$   
 $= \frac{732}{25} = 29.72$  M1 A1

- (iv) Median = 30°C B1  
 (v) Mode = 32°C B1  
 (vi) Mean as it an average of all the values B2 (13 marks)

3. (a) No; as the exact number of 'under 5' or 'over 10' is not given B1  
 (b) Class A : 7 ; Class B : 7 B1 B1  
 (c) For this data, the mode (Class A : 8 ; Class B : 6) gives a better comparison than the median (which are identical) B2 (5 marks)

4. (a) (i) 14 B1  
 (ii)  $10 + 15 + 14 + 27 + 19 + 25 + 30 = 140$  M1 A1  
 (iii)  $\frac{140}{7} = 20$  M1 A1  
 (b)  $34 - 20 = 14$  M1 A1  
 (c) The swings, as its mean was 20 (>18) B1 (8 marks)

# UNIT 17 Measures of Central Tendency

# CSEC Revision Test ANSWERS

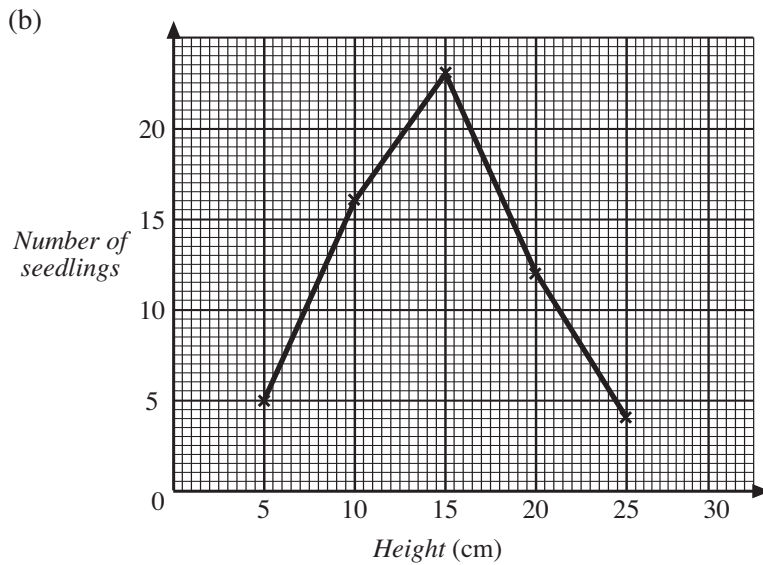
5. (a) Frequency polygon B2  
 (b) 
$$\frac{[(30 \times 7) + (50 \times 19) + (70 \times 11) + (90 \times 3)]}{40}$$

$$= 55$$
 M2  
A1 (5 marks)

6. (a) (i)  $5 + 16 + 23 + 12 + 4 = 60$  M1 A1  
 (ii) Mean =  $(5 \times 5 + 10 \times 16 + 15 \times 23 + 20 \times 12 + 25 \times 4) \div 60$   

$$= \frac{870}{60}$$
 M1 A1  

$$= 14.5$$
 A1



(-1 for each mistake) B5

- (c) probability =  $\frac{5 + 16}{60} = \frac{21}{60} = 0.35$  M1 A1 (12 marks)

7. (a)  $(1 + 2 + 84 + 352 + 185 + 81 + 27) \div 12$  M1 A1  

$$= 61 \text{ mm}$$
 A1

- (b) (i) 0 to 352  $\Rightarrow$  352 mm B1  
 (ii) 29 to 84  $\Rightarrow$  55 mm M1 A1

- (c) Gambia B1

- (d) Although the mean is slightly larger for Gambia, its range is considerably larger, and water supply will depend totally on what happens in April and September each year; for half the year, Gambia has essentially no rainfall. B2

- (e) 
$$\left. \begin{array}{l} 45 - 55 \quad | \quad | \\ 55 - 65 \quad | \quad | \\ 65 - 75 \quad | \quad | \\ 75 - 85 \quad | \quad | \quad | \\ 85 - 95 \quad | \quad | \end{array} \right\} \text{ hence missing data must belong to } 55 - 65 \text{ class interval}$$
 M1 A1

(11 marks)

**(TOTAL MARKS: 59)**