MARKING GUIDELINE

MARKS	DURATION	QUESTIONS
31	50 minutes	3

Name: _____ Class: _____

Date: _____

MARK ____ / 31

INSTRUCTIONS AND INFORMATION

1. Answer **ALL** the questions in this question paper.
2. Answer QUESTION 1 by **circling** the letter (A–D) in the answer grid at the end of that section.
3. Show **ALL** calculations clearly.
4. Show all units where applicable.
5. Number the answers correctly according to the numbering system used in this question paper.
6. A non-programmable calculator may be used, unless stated otherwise.
7. Write neatly and legibly.

QUESTION 1 [10 MARKS]

Four options are given as possible answers to the following questions. Choose the correct answer and circle the letter (A–D) in the grid at the end of this section. If you want to change your choice, put a cross through the wrong letter and circle your new choice.

1.1 For the data 3 ; 5 ; 5 ; 8 ; 9, the MODE is ... (1)

A) 8 **B)** 6

C) 9 **D)** 5 ✓

> **Answer: D** — 5 occurs twice, more often than any other value.
> - **A** — that is the fourth value
> - **B** — that is the mean
> - **C** — that is the largest value

1.2 For the same data, the MEAN is ... (1)

A) 6 ✓ **B)** 8

C) 5 **D)** 30

> **Answer: A** — $30 \div 5 = 6$.
> - **B** — that is the fourth value
> - **C** — that is the mode
> - **D** — that is the total

1.3 For the same data, the MEDIAN is ... (1)

A) 3 **B)** 6

C) 8 **D)** 5 ✓

> **Answer: D** — With five values in order, the middle one is the third: 5.
> - **A** — that is the POSITION of the median (the 3rd value), not its value
> - **B** — that is the mean
> - **C** — that is the fourth value

1.4 For the same data, the RANGE is ... (1)

A) 5 **B)** **6 ✓**

C) 9 **D)** 3

> **Answer: B** — $9 - 3 = 6$.
> - **A** — that is the mode
> - **C** — that is the largest value
> - **D** — that is the smallest value

1.5 The MEDIAN of an EVEN number of values is ... (1)

A) **the mean of the two middle values ✓** **B)** the largest minus the smallest

C) the most common value **D)** the middle value

> **Answer: A** — There is no single middle value, so the two are averaged.
> - **B** — that is the range
> - **C** — that is the mode
> - **D** — there is no single middle one

1.6 Six learners score 4 ; 6 ; 6 ; 7 ; 9 ; 10. The median is ... (1)

A) 7 **B)** 8

C) **6,5 ✓** **D)** 6

> **Answer: C** — The two middle values are 6 and 7, and their mean is 6,5.
> - **A** — that is only the fourth value
> - **B** — averaged the 4th and 5th values, 7 and 9
> - **D** — that is only the third value

1.7 Which measure is MOST affected by one very large value? (1)

A) the median **B)** **the mean ✓**

C) the mode **D)** none of them

> **Answer: B** — Every value enters the mean, so an extreme one pulls it.
> - **A** — the median counts positions, not sizes
> - **C** — the mode only counts how often values occur
> - **D** — the mean is clearly affected

1.8 The mean of five numbers is 12. Their TOTAL is ... (1)

A) **60 ✓** **B)** 17

C) 2,4 **D)** 12

> **Answer: A** — Total = mean × how many = 12×5.
> - **B** — added 5 to the mean
> - **C** — divided instead of multiplying
> - **D** — that is the mean itself

1.9 A sixth number, 18, is added to those five. The new mean is ... (1)

A) 12 **B)** 15

C) 13 ✓ **D)** 78

> **Answer: C** — New total 78 over 6 values.
> - **A** — the mean must change, since 18 is above it
> - **B** — that is the mean of 12 and 18
> - **D** — that is the new TOTAL, not the mean

1.10 If every value in a data set is increased by 5, the RANGE ... (1)

A) doubles **B) stays the same ✓**

C) increases by 5 **D)** increases by 10

> **Answer: B** — Both the largest and the smallest rise by 5, so their difference is unchanged.
> - **A** — both ends shift equally, so nothing doubles
> - **C** — the MEAN increases by 5, but the range does not
> - **D** — adding 5 to every value does not add 10 to the difference

ANSWER GRID — MARKING GUIDELINE

1.1	A	B	C	**D**
1.2	**A**	B	C	D
1.3	A	B	C	**D**
1.4	A	**B**	C	D
1.5	**A**	B	C	D
1.6	A	B	**C**	D
1.7	A	**B**	C	D
1.8	**A**	B	C	D
1.9	A	B	**C**	D
1.10	A	**B**	C	D

QUESTION 2 [11 MARKS]

The number of books read in a year by each of seven learners is: 12 ; 15 ; 15 ; 18 ; 20 ; 22 ; 24

2.1 Calculate the mean number of books read. (3)

> Total $= 12 + 15 + 15 + 18 + 20 + 22 + 24 = 126$ *(2)*
>
> Mean $= \frac{126}{7} =$ **18 books** *(1)*

2.2 Write down the median and the mode, and explain why they are not the same. (4)

> Median = **18** *(the 4th of 7 ordered values) (1)*
> Mode = **15** *(the only value that repeats) (1)*
> The median is the MIDDLE value *(1)*
> while the mode is the MOST COMMON value *(1)*

2.3 An eighth learner, who read 46 books, joins the group. Calculate the new mean and comment on the effect of this value. **(4)**

> New total $= 126 + 46 = 172$ *(1)*
> New mean $= \frac{172}{8} =$ **21,5 books** *(2)*
> 46 is an **outlier**, and it has pulled the mean up by 3,5 *(1)*

QUESTION 3 [10 MARKS]

Answer the following.

3.1 The mean of five numbers is 24. Four of the numbers are 18 ; 22 ; 25 and 31. Calculate the fifth number. **(4)**

> Total of all five $= 5 \times 24 = 120$ *(2)*
> $18 + 22 + 25 + 31 = 96$ *(1)*
> Fifth number $= 120 - 96 =$ **24** *(1)*

3.2 In a small company most workers earn about R8 000 a month, but the owner earns R150 000. State which of the mean or the median better describes a typical salary, and give a reason. **(3)**

> The **median** *(1)*
> The owner's salary is an outlier *(1)*
> and it pulls the MEAN far above what a typical worker actually earns *(1)*

3.3 The range of a set of five numbers is 18 and the smallest number is 7. Write down the largest number, and explain what the range tells you. **(3)**

> Largest $= 7 + 18 =$ **25** *(2)*
> The range measures how SPREAD OUT the data is *(1)*

TOTAL: 31 marks

This question paper consists of 3 questions.

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