EXAM-STYLE CLASS TEST

MARKS	DURATION	QUESTIONS
51	1 hour 20 minutes	4

Name: ..... Class: .....

Date: .....

MARK ____ / 51

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 The STANDARD DEVIATION measures ... (1)

A) the most common value
B) the middle value of the data
C) how spread out the data is about the mean
D) the gap between the largest and smallest values

1.2 If every value in a data set is increased by 5, the standard deviation ... (1)

A) stays the same
B) is multiplied by 5
C) increases by 25
D) increases by 5

1.3 An OGIVE is a graph of ... (1)

A) frequency against the lower class boundary
B) cumulative frequency against frequency
C) cumulative frequency against the upper class boundary
D) frequency against the class midpoint

1.4 On an ogive of 80 values, the MEDIAN is read off at a cumulative frequency of ... (1)

A) 80
B) 40
C) 60
D) 20

1.5 A value is usually called an OUTLIER when it lies more than ... beyond the nearest quartile. (1)

A) half the range
B) $1 \times$ IQR
C) 2 standard deviations
D) $1{,}5 \times$ IQR

1.6 For 2 ; 4 ; 4 ; 4 ; 5 ; 5 ; 7 ; 9, the MEAN is ... (1)

A) 5 **B)** 40

C) $4{,}5$ **D)** 4

1.7 For that same data set, the STANDARD DEVIATION is ... (1)

A) $2{,}14$ **B)** 32

C) 4 **D)** 2

1.8 On a box-and-whisker plot, a LONG right whisker suggests the data is ... (1)

A) symmetrical **B)** skewed to the right

C) bimodal **D)** skewed to the left

1.9 Data lies within ONE standard deviation of the mean when it lies between ... (1)

A) the mean and the mean plus σ **B)** 0 and σ

C) the mean minus σ and the mean plus σ **D)** Q_1 and Q_3

1.10 Two classes have the SAME mean, but class A has the larger standard deviation. This means ... (1)

A) class A had more learners **B)** class A's marks are more spread out

C) class A did better on average **D)** class A necessarily had the highest single mark

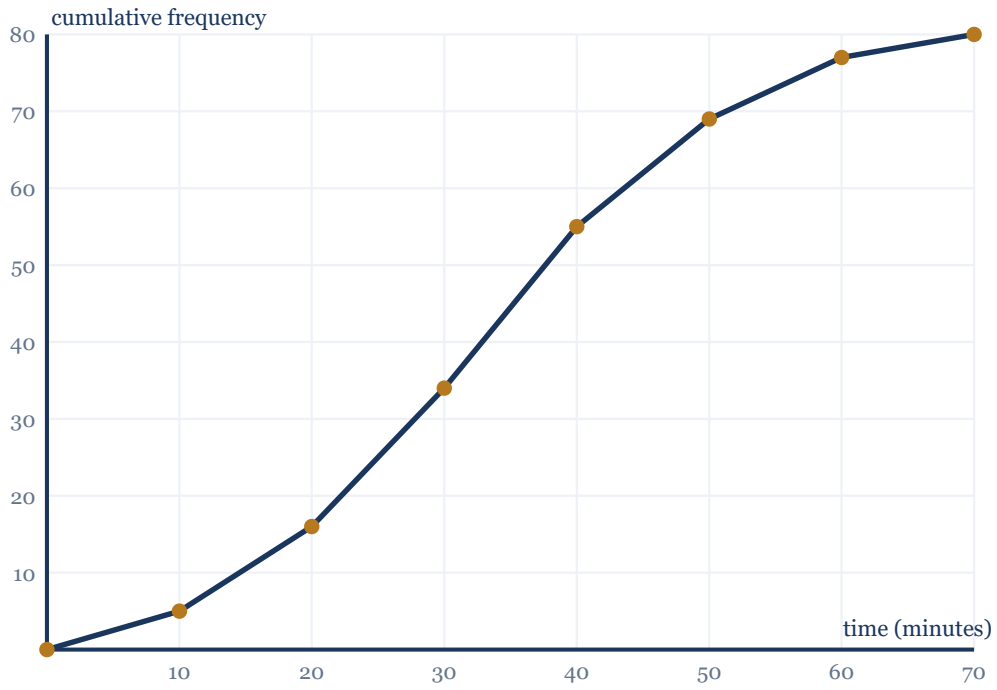
ANSWER GRID — CIRCLE YOUR ANSWERS FOR QUESTION 1

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 [14 MARKS]

Eighty Grade 11 learners recorded the time, in minutes, that they spent on Mathematics homework on one evening. The results are summarised in the table below, and the ogive (cumulative frequency curve) for the same data is drawn beneath it.

Time (minutes)	$0 \leq t < 10$	$10 \leq t < 20$	$20 \leq t < 30$	$30 \leq t < 40$	$40 \leq t < 50$	$50 \leq t < 60$	$60 \leq t < 70$
Number of learners	5	11	18	21	14	8	3
Cumulative frequency	5	...	...	...	...	...	...



2.1 Complete the cumulative frequency row of the table. **(3)**

2.2 Use the ogive to estimate the median time spent on homework. Show, on the graph, how you obtained your answer. **(3)**

2.3 Use the ogive to estimate the interquartile range of the data. **(4)**

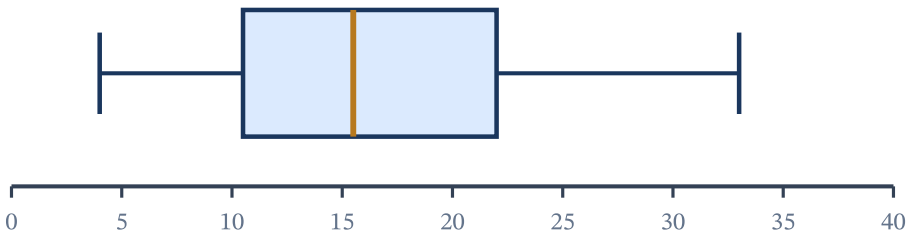
2.4 Estimate the number of learners who spent MORE than 40 minutes on homework, and hence write down the probability that a learner chosen at random from this group spent more than 40 minutes. **(4)**

QUESTION 3 [17 MARKS]

The number of learners arriving late at a school was recorded on each of twelve days. The data, already arranged from smallest to largest, is:

4 ; 7 ; 9 ; 12 ; 12 ; 15 ; 16 ; 18 ; 21 ; 23 ; 28 ; 33

The box-and-whisker diagram below was drawn from this data.



3.1 Calculate the mean and the standard deviation of the data, correct to TWO decimal places. **(3)**

3.2 Write down the five-number summary of the data and hence calculate the interquartile range. **(4)**

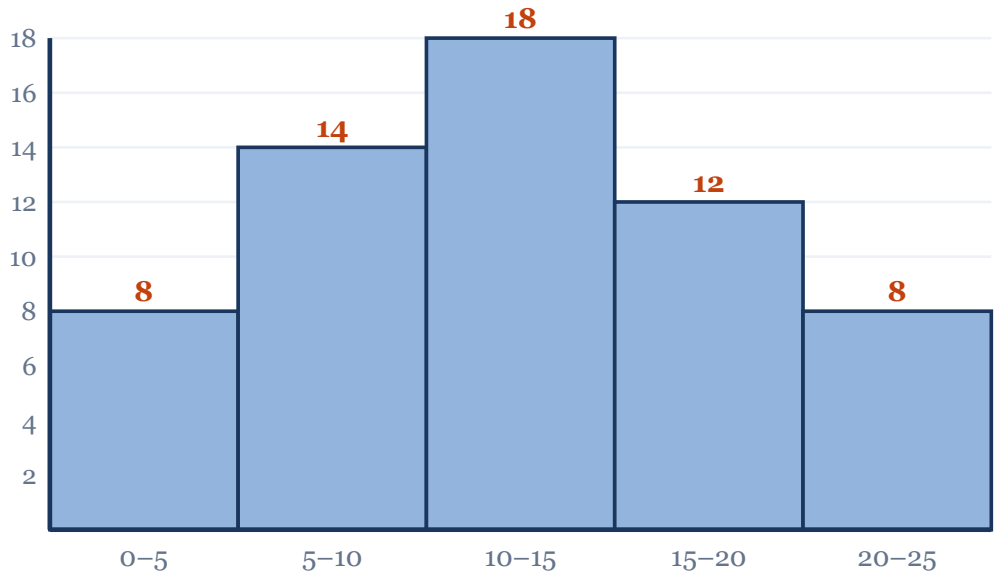
3.3 Describe the skewness of this data, and justify your answer by referring BOTH to the box-and-whisker diagram and to the mean and the median. **(3)**

3.4 A day is called a PROBLEM DAY if the number of latecomers is more than one standard deviation above the mean. Determine how many of the twelve days were problem days. **(3)**

3.5 Use the $1{,}5 \times$ IQR rule to determine whether the largest value is an outlier. **(4)**

QUESTION 4 [10 MARKS]

The histogram below shows the mass, in kilograms, of 60 parcels handled at a depot on one morning.



mass (kg) — number of parcels on each bar

4.1 Use the midpoints of the intervals to estimate the mean mass of a parcel, correct to TWO decimal places. (4)

4.2 Write down the modal class, and explain why the answer to the previous part can only ever be an ESTIMATE. (3)

4.3 Determine, with a reason, the interval in which the median mass lies. (3)

TOTAL: 51 marks

This question paper consists of 4 questions.

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