MARKING GUIDELINE

MARKS	DURATION	QUESTIONS
36	55 minutes	4

Name: _____ Class: _____

Date: _____

MARK ____ / 36

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 In 5^3, the number 3 is called the ... (1)

A) coefficient
B) product
C) base
D) exponent ✓

Answer: D — The exponent says how many times the base is multiplied by itself.

- **A** — there is no coefficient here
- **B** — the product is the answer, 125
- **C** — the base is the 5

1.2 $5^3 = \ldots$ (1)

A) 53
B) 15
C) 125 ✓
D) 8

Answer: C — $5 \times 5 \times 5 = 125$.

- **A** — read the two digits side by side
- **B** — multiplied the base by the exponent
- **D** — added the base and the exponent

1.3 $2 \times 2 \times 2 \times 5 \times 5$ written in exponential form is ... (1)

A) $2^3 \times 5^2$ ✓
B) 10^5
C) 6×10
D) $2^2 \times 5^3$

Answer: A — Three 2s and two 5s.

- **B** — added the number of factors
- **C** — ADDED the 2s (6) and the 5s (10) instead of using exponents
- **D** — counted the 2s and 5s the wrong way round

1.4 $\sqrt{81} = \ldots$ (1)

A) 9 ✓ **B)** $40{,}5$

C) 8 **D)** $6\ 561$

> **Answer: A** — $9 \times 9 = 81$.
> - **B** — HALVED 81 instead of rooting it
> - **C** — guessed from the digits
> - **D** — that is 81 SQUARED

1.5 Which one of the following numbers is a perfect square AND a perfect cube? (1)

A) 16 **B)** 64 ✓

C) 36 **D)** 81

> **Answer: B** — $64 = 8^2$ and $64 = 4^3$.
> - **A** — a square only
> - **C** — a square only
> - **D** — a square only

1.6 $\sqrt[3]{64} = \ldots$ (1)

A) 4 ✓ **B)** $21{,}3$

C) 16 **D)** 8

> **Answer: A** — $4 \times 4 \times 4 = 64$.
> - **B** — divided 64 by 3
> - **C** — that is $64 \div 4$
> - **D** — that is the SQUARE root of 64

1.7 Written in scientific notation, $125\ 000$ is ... (1)

A) $12{,}5 \times 10^4$ **B)** $1{,}25 \times 10^5$ ✓

C) 125×10^3 **D)** $1{,}25 \times 10^4$

> **Answer: B** — The first number must be at least 1 and less than 10, and the comma moves 5 places.
> - **A** — $12{,}5$ is not less than 10
> - **C** — 125 is not less than 10
> - **D** — the comma moves 5 places, not 4

1.8 $3^2 + 4^2 = \ldots$ (1)

A) 7^2 **B)** 14

C) 49 **D)** 25 ✓

> **Answer: D** — $9 + 16 = 25$.
> - **A** — squaring is not distributive over addition
> - **B** — multiplied each base by 2 instead of squaring it: $6 + 8 = 14$
> - **C** — added the bases first and then squared

1.9 A square has an area of $144\ \text{cm}^2$. Its PERIMETER is ... (1)

A) 576 cm **B)** 12 cm

C) 48 cm ✓ **D)** 36 cm

> **Answer: C** — Side $= \sqrt{144} = 12$ cm, so the perimeter is $4 \times 12 = 48$ cm.
> - **A** — multiplied the AREA by 4
> - **B** — that is the SIDE, not the perimeter
> - **D** — used 3 sides instead of 4

1.10 Which one of the following is the LARGEST? (1)

A) 4^2 **B)** 5^2

C) 2^5 ✓ **D)** 3^3

> **Answer: C** — The four values are 16, 25, 32 and 27.
> - **A** — 16
> - **B** — 25
> - **D** — 27

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 [9 MARKS]

Calculate the following WITHOUT using a calculator. Show all your working.

2.1 $\sqrt{81} + \sqrt[3]{125}$ (3)

$= 9$ *(1)*
$+ 5$ *(1)*
$=$ **14** *(1)*

2.2 $5^2 - 3^3 + \sqrt{49}$ (3)

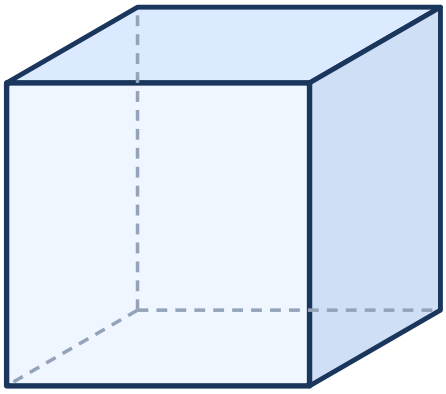
$= 25 - 27 + 7$ *(2)*
$=$ **5** *(1)*

2.3 Between which two consecutive whole numbers does $\sqrt{50}$ lie? Give a reason for your answer. (3)

$7^2 = 49$ and $8^2 = 64$ *(2)*
$49 < 50 < 64$, so $\sqrt{50}$ lies between **7 and 8** *(1)*

QUESTION 3 [9 MARKS]

The diagram below shows a cube. The volume of the cube is $125\ \text{cm}^3$.



3.1 Determine the length of one edge of the cube. (3)

edge $= \sqrt[3]{125}$ *(1)*
$= \mathbf{5\ cm}$ *(2)*

3.2 Hence calculate the total surface area of the cube. (3)

A cube has 6 square faces *(1)*
SA $= 6 \times 5^2 = 6 \times 25$ *(1)*
$= \mathbf{150\ cm^2}$ *(1)*

3.3 A square tile has an area of $144\ \text{cm}^2$. Calculate the perimeter of the tile. (3)

side $= \sqrt{144} = 12$ cm *(2)*
Perimeter $= 4 \times 12 = \mathbf{48\ cm}$ *(1)*

QUESTION 4 [8 MARKS]

Answer the following.

4.1 Write $2 \times 2 \times 2 \times 5 \times 5$ in exponential form. (2)

$= \mathbf{2^3 \times 5^2}$ *(2)*

4.2 Hence calculate the value of the expression in the previous question. (2)

$= 8 \times 25$ *(1)*
$= \mathbf{200}$ *(1)*

4.3 Only ONE of the numbers 16 ; 36 ; 64 ; 81 is both a perfect square AND a perfect cube. Write down that number and justify your answer. (4)

64 *(1)*
$64 = 8^2$, so it is a perfect square *(1)*
$64 = 4^3$, so it is a perfect cube *(2)*

TOTAL: 36 marks

This question paper consists of 4 questions.

© Danemathics — free to print and share for classroom use.