EXAM-STYLE CLASS TEST

MARKS	DURATION	QUESTIONS
32	50 minutes	3

Name: _____ Class: _____

Date: _____

MARK ____ / 32

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 value of the sum of $2k$, for k running from 1 to 5, is ... (1)

A) 10 **B)** 20
C) 15 **D)** 30

1.2 In sigma notation, the number written BELOW the sigma is ... (1)

A) the last value of the counter **B)** the common difference
C) the first value of the counter **D)** the number of terms

1.3 A sum runs with its counter from $k = 3$ to $k = 20$. The number of terms is ... (1)

A) 23 **B)** 18
C) 20 **D)** 17

1.4 A geometric series CONVERGES when ... (1)

A) $r \leq -1$ **B)** $r > 1$
C) $r \geq 1$ **D)** $-1 < r < 1$

1.5 The sum to infinity of $12 + 6 + 3 + \ldots$ is ... (1)

A) 24 **B)** 21
C) 48 **D)** 12

1.6 For which values of x does $1 + x + x^2 + x^3 + \ldots$ converge? (1)

A) $x > 1$ **B)** all real x
C) $-1 < x < 1$ **D)** x is not 0

1.7 The value of the sum of $3k$, for k running from 1 to 10, is ... (1)

A) 150 **B)** 30

C) 165 **D)** 55

1.8 The value of the sum of the CONSTANT 4, for k running from 1 to 7, is ... (1)

A) 11 **B)** 28

C) 7 **D)** 4

1.9 A SERIES is the ... of a sequence. (1)

A) sum **B)** ratio

C) difference **D)** list

1.10 If $S_\infty = 40$ and $a = 10$, then $r = ...$ (1)

A) $0{,}75$ **B)** 4

C) $0{,}25$ **D)** 30

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 [9 MARKS]

Consider the series $3 + 9 + 15 + ... + 273$.

2.1 Determine how many terms there are in the series. (3)

2.2 Determine the sum of the series. **(3)**

2.3 Write the series in sigma notation. **(3)**

QUESTION 3 [13 MARKS]

Answer the questions below on geometric series.

3.1 Determine the value of n if $\Sigma_{k=3}^{n}\ 8(2)^{k-1} = 131\,040$. **(5)**

3.2 Gold is extracted from an old mine heap. Processing $1\ 000$ tons of gravel yields 30 kg of gold the first time, 24 kg the second, $19{,}2$ kg the third and so on. Determine the MAXIMUM amount of gold that can be recovered. **(4)**

3.3 Determine the values of x for which the series $\Sigma 3(2x)^{n-1}$ converges. **(4)**

TOTAL: 32 marks

This question paper consists of 3 questions.

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