EXAM-STYLE CLASS TEST

MARKS	DURATION	QUESTIONS
36	55 minutes	3

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 By the Remainder Theorem, dividing $f(x)$ by $(x - a)$ leaves a remainder of ... (1)

A) a **B)** $f(-a)$

C) 0 **D)** $f(a)$

1.2 The remainder when $x^3 - 2x^2 + 5$ is divided by $(x - 2)$ is ... (1)

A) 5 **B)** 0

C) -11 **D)** -3

1.3 $(x - 3)$ is a factor of $f(x)$ exactly when ... (1)

A) $f(-3) = 0$ **B)** $f(3) = 0$

C) $f(3) = 3$ **D)** $f(0) = 3$

1.4 Which is a factor of $f(x) = x^3 - 4x^2 + x + 6$? (1)

A) $(x + 2)$ **B)** $(x - 1)$

C) $(x - 2)$ **D)** $(x - 6)$

1.5 Fully factorised, $x^3 - 4x^2 + x + 6 = ...$ (1)

A) $(x + 2)(x - 3)(x + 1)$ **B)** $(x - 2)(x - 3)(x + 1)$

C) $(x - 2)(x + 3)(x - 1)$ **D)** $(x - 2)(x^2 - 2x - 3)$

1.6 Solve for x: $x^3 - 4x^2 + x + 6 = 0$ (1)

A) $x = 2$ only **B)** $x = 2$, $x = -3$ or $x = 1$

C) $x = -2$, $x = -3$ or $x = 1$ **D)** $x = 2$, $x = 3$ or $x = -1$

1.7 A cubic polynomial has AT MOST ... x-intercepts. (1)

A) 4 **B)** 2

C) 1 **D)** 3

1.8 Dividing $x^3 + 2x^2 - 5x - 6$ by $(x + 1)$ gives a quotient of ... (1)

A) $x^2 + 3x - 6$ **B)** $x^2 + 2x - 5$

C) $x^2 + x - 6$ **D)** $x^2 - x - 6$

1.9 If $f(x) = 2x^3 + kx - 6$ and $(x - 1)$ is a factor, then $k =$ ... (1)

A) 4 **B)** 6

C) 8 **D)** -4

1.10 The remainder when $f(x)$ is divided by $(2x - 1)$ is ... (1)

A) $f(1)$ **B)** $f(½)$

C) $f(-½)$ **D)** $f(2)$

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 [13 MARKS]

Given $f(x) = 2x^3 - 5x^2 - 4x + 3$.

2.1 Determine the remainder when $f(x)$ is divided by $(x - 1)$. (3)

2.2 Show that $(x - 3)$ is a factor of $f(x)$. **(3)**

2.3 Hence factorise $f(x)$ COMPLETELY. **(4)**

2.4 Hence solve for x: $f(x) = 0$, and write down the SUM of the three roots. **(3)**

QUESTION 3 [13 MARKS]

Given $g(x) = x^3 + px^2 - x - 6$.

3.1 Determine the value of p for which $(x + 1)$ is a factor of $g(x)$. **(4)**

3.2 Using this value of p, factorise $g(x)$ completely. **(4)**

3.3 Hence write down the x-intercepts of the graph of g, and calculate its y-intercept. **(3)**

3.4 Explain why a cubic graph can have at most THREE x-intercepts. **(2)**

TOTAL: 36 marks

This question paper consists of 3 questions.

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