EXAM-STYLE CLASS TEST

MARKS	DURATION	QUESTIONS
33	50 minutes	3

Name: _____ Class: _____

Date: _____

MARK _____ / 33

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 DISCRIMINANT of $ax^2 + bx + c = 0$ is ... (1)

A) $\sqrt{b^2 - 4ac}$ **B)** $b^2 + 4ac$

C) $-b^2 - 4ac$ **D)** $b^2 - 4ac$

1.2 If $\Delta > 0$ AND Δ is a perfect square, the roots are ... (1)

A) real and equal **B)** real, rational and unequal

C) non-real **D)** real, irrational and unequal

1.3 If $\Delta = 0$, the roots are ... (1)

A) one real and one non-real **B)** non-real

C) real and unequal **D)** real and equal

1.4 For $x^2 - 6x + 9 = 0$, the roots are ... (1)

A) non-real **B)** rational and unequal

C) real and equal **D)** real and unequal

1.5 For $2x^2 + 3x + 5 = 0$, the roots are ... (1)

A) non-real **B)** real and rational

C) real and equal **D)** real and irrational

1.6 For $x^2 - 5x + 3 = 0$, the roots are ... (1)

A) non-real **B)** real and equal

C) real, rational and unequal **D)** real, irrational and unequal

1.7 For which value(s) of k does $x^2 + kx + 4 = 0$ have EQUAL roots? (1)

A) $k = 4$ or $k = -4$ **B)** $k = 4$ only

C) $k = 16$ **D)** $k = 2$

1.8 If $\Delta < 0$, the graph of the quadratic ... (1)

A) lies entirely below the x-axis **B)** touches the x-axis once

C) does not cut the x-axis **D)** cuts the x-axis twice

1.9 For $3x^2 - 12x + 12 = 0$, $\Delta = ...$ (1)

A) 0 **B)** 288

C) 144 **D)** -144

1.10 For which values of k does $x^2 + 2x + k = 0$ have REAL roots? (1)

A) $k \geq 1$ **B)** $k \leq 1$

C) $k < 1$ **D)** $k = 1$

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]

Use the discriminant $\Delta = b^2 - 4ac$ to answer the questions below.

2.1 Describe the nature of the roots of $x^2 - 4x + 4 = 0$. (3)

2.2 Describe the nature of the roots of $x^2 + 3x + 5 = 0$. **(3)**

2.3 Describe the nature of the roots of $2x^2 - 7x + 3 = 0$. **(3)**

QUESTION 3 [14 MARKS]

Answer the questions below.

3.1 Determine the value(s) of k for which $kx^2 + 4x + 2 = 0$ has REAL roots. **(5)**

3.2 Determine the value(s) of p for which $x^2 + px + 9 = 0$ has equal roots. **(4)**

3.3 State what the discriminant tells you about the GRAPH of $y = ax^2 + bx + c$. **(3)**

3.4 Explain the difference between roots that are RATIONAL and roots that are IRRATIONAL. **(2)**

TOTAL: 33 marks

This question paper consists of 3 questions.

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