EXAM-STYLE CLASS TEST

MARKS	DURATION	QUESTIONS
34	55 minutes	3

Name: _____ Class: _____

Date: _____

MARK ____ / 34

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 general solution of $\sin\theta = 0{,}5$ is ... (1)

A) $\theta = 30° + k(180°)$
B) $\theta = 30° + k(360°)$ only
C) $\theta = 30° + k(360°)$ or $\theta = 150° + k(360°)$
D) $\theta = 30° + k(360°)$ or $\theta = 330° + k(360°)$

1.2 The general solution of $\cos\theta = 0{,}5$ is ... (1)

A) $\theta = 60° + k(360°)$ or $\theta = 120° + k(360°)$
B) $\theta = 60° + k(360°)$ or $\theta = -60° + k(360°)$
C) $\theta = 60° + k(180°)$
D) $\theta = 60° + k(360°)$ only

1.3 The general solution of $\tan\theta = 1$ is ... (1)

A) $\theta = 45°$ only
B) $\theta = 45° + k(360°)$
C) $\theta = 45° + k(180°)$
D) $\theta = 45°$ or $\theta = 135° + k(360°)$

1.4 Solve $\sin\theta = -0{,}5$ for $0° \leq \theta \leq 360°$. (1)

A) $210°$ and $330°$
B) $-30°$ only
C) $30°$ and $150°$
D) $150°$ and $210°$

1.5 Solve $\cos\theta = -0{,}5$ for $0° \leq \theta \leq 360°$. (1)

A) $120°$ and $240°$
B) $240°$ only
C) $60°$ and $120°$
D) $60°$ and $300°$

1.6 In which quadrants is $\tan\theta$ POSITIVE? (1)

A) the second and fourth
B) the first and third
C) the first and fourth
D) the first and second

1.7 Solve $2\sin\theta - 1 = 0$ for $0° \leq \theta \leq 360°$. (1)

A) $30°$ and $330°$ **B)** $30°$ only

C) $30°$ and $150°$ **D)** $60°$ and $120°$

1.8 The general solution of $\sin 2\theta = 0{,}5$ is ... (1)

A) $\theta = 15° + k(360°)$ or $\theta = 75° + k(360°)$ **B)** $\theta = 15° + k(180°)$ or $\theta = 75° + k(180°)$

C) $\theta = 30° + k(360°)$ or $\theta = 150° + k(360°)$ **D)** $\theta = 60° + k(180°)$

1.9 Why is a GENERAL solution needed? (1)

A) the reference angle is always negative **B)** there is never more than one solution

C) the calculator gives a wrong answer **D)** the trigonometric functions repeat, so there are infinitely many solutions

1.10 For $\sin\theta = 0{,}8$ the calculator gives $53{,}13°$. The SECOND solution in $[0° ; 360°]$ is ... (1)

A) $36{,}87°$ **B)** $233{,}13°$

C) $306{,}87°$ **D)** $126{,}87°$

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]

Determine the GENERAL SOLUTION of each equation, with $k \in \mathbb{Z}$.

2.1 $3\sin x - 1 = 0$, correct to TWO decimal places (5)

2.2 $\cos 2x = 0{,}5$ **(4)**

2.3 $\tan(x - 30°) = 1$ **(4)**

QUESTION 3 [11 MARKS]

Answer the questions below.

3.1 Solve for $x \in [0° ; 360°]$: $2\cos^2 x - \cos x - 1 = 0$ **(6)**

3.2 Explain why a trigonometric equation has infinitely many solutions, but only a few in a given interval. **(3)**

3.3 Explain why $\sin x = 1{,}5$ has no solution. **(2)**

TOTAL: 34 marks

This question paper consists of 3 questions.

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