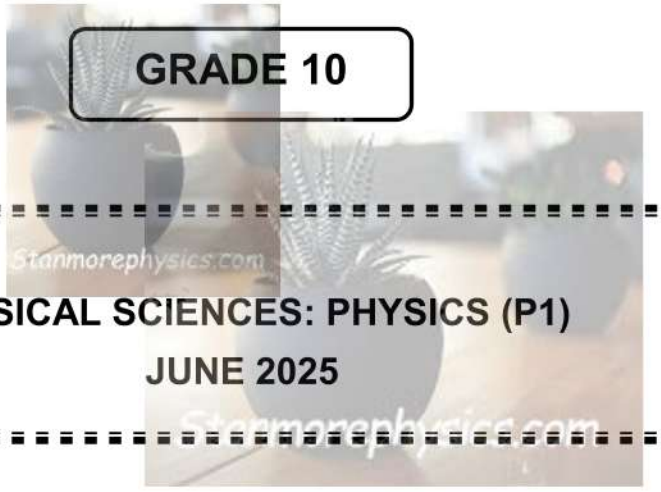
education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 10



PHYSICAL SCIENCES: PHYSICS (P1)

JUNE 2025

MARKS: 75

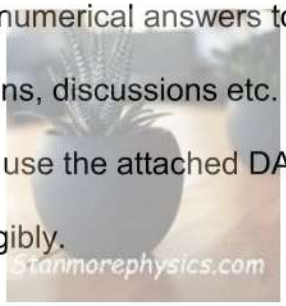
TIME: 1½ HOURS

This question paper consists of 8 pages and 1 datasheet.

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INSTRUCTIONS AND INFORMATION

1. This question paper consists of 6 questions. Answer ALL the questions in the ANSWER BOOK.
2. Start EACH question on a NEW page in the ANSWER BOOK.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Leave ONE line between two sub questions, e.g. between QUESTION 2.1 and QUESTION 2.2.
5. You may use a non-programmable calculator.
6. Show ALL formulae and substitutions in ALL calculations.
7. Round off the final numerical answers to a minimum of TWO decimal places.
8. Give brief motivations, discussions etc. where required.
9. You are advised to use the attached DATA SHEET.
10. Write neatly and legibly.



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QUESTION 1 (MULTIPLE CHOICE)

Various options are provided as possible answers to the following questions. Each question has only ONE correct answer. Choose the answer and write only the letter(A-D) next to the question number(1.1 to 1.5) in the ANSWER BOOK, e.g. 1.6 E.

1.1 Which ONE of the following best describes a transverse wave?

A The particles of the medium move in circles.

B The particles of the medium vibrate parallel to the direction of motion of the wave

C The particles of the medium vibrate at right angles to the direction of motion of the wave.

D The wave travels through a vacuum only. (2)

1.2 Sound travels the fastest through a …

A solid.

B liquid.

C gas.

D vacuum. (2)

1.3 Which ONE of the following electromagnetic radiations are correctly arranged in the order of a decreasing wavelength?

A radio waves, microwaves, visible light, infrared

B radio waves, microwaves, infrared, visible light

C infrared, microwaves, visible light, radio waves

D visible light, Infrared, microwaves, radio waves (2)

1.4 One volt is equivalent to …

A $1\ C \cdot s^{-1}$

B $1\ J \cdot A^{-1}$.

C $1\ A \cdot s^{-1}$.

D $1\ J \cdot C^{-1}$. (2)

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1.5 Refer to the diagram below.

Q and **R** are small spheres suspended by light insulated strings.

When a negatively charged rod is brought close to sphere **Q**, sphere **Q** is repelled. When the negatively charged rod is brought close to sphere **R**, sphere **R** is attracted.



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Which ONE of the combinations below can be possible for the nature of the charges on spheres **Q** and **R**?

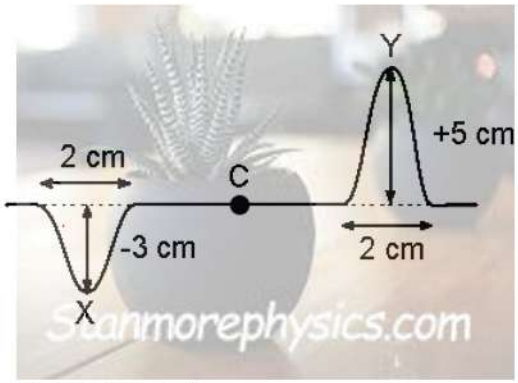
	NATURE OF CHARGE ON SPHERE Q	NATURE OF CHARGE ON SPHERE R
A	Negative	Negative
B	Positive	Neutral
C	Neutral	Positive
D	Negative	Neutral

(2)
[10]

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QUESTION 2

Two pulses, **X** and **Y**, approach each other in a spring. Pulse **X** has an amplitude of –3 cm and pulse **Y** has an amplitude of +5 cm.



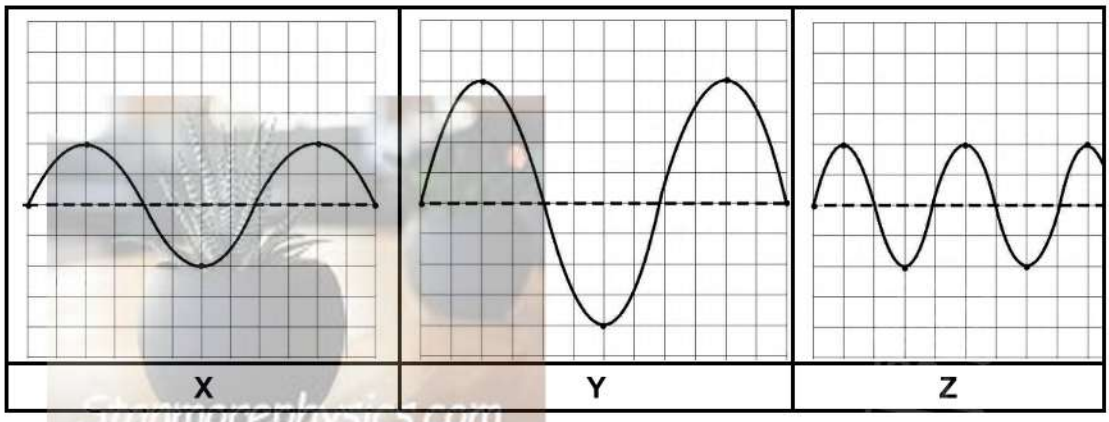
2.1 Define the term *transverse pulse*. (2)

2.2 Moments later the two pulses meet at point **C**.

2.2.1 Calculate the maximum amplitude of the pulse at point **C**. (2)

2.2.2 Name the principle used to answer QUESTION 2.2.1 (1)

The diagram below represents THREE sound waves **X**, **Y** and **Z** that are produced when three different notes are played on a musical instrument.
Each block represents 1 unit.



2.3 What type of wave is a sound wave. (1)

2.4 Which wave represent the note that…..

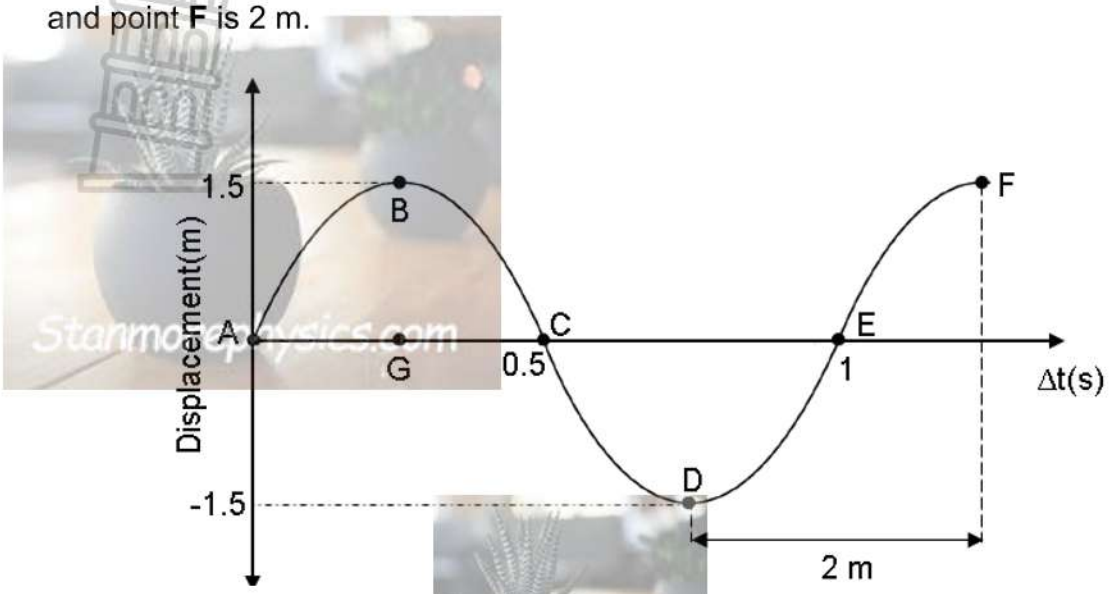
2.4.1 is the loudest. (1)

2.4.2 has the highest pitch. (1)

2.5 Name one medical use of ultra sound. (1)
[9]

QUESTION 3

The diagram below represents a water wave moving from left to right. It takes 1s for the wave to move from point **A** to point **E**. The horizontal distance between point **D** and point **F** is 2 m.



3.1 Define the term *wavelength*. (2)

3.2 Write down the letter(s) that represents …

3.2.1 a wavelength (2)

3.2.2 a trough (1)

3.3 Determine the magnitude of the wavelength. (2)

3.4 Write down the magnitude of the amplitude. (1)

3.5 Calculate the:

3.5.1 Frequency of the wave. (3)

3.5.2 Speed of the wave. (3)

3.6 The frequency of the wave is now halved.

Write down the magnitude of the period of the wave. (2)

[16]

QUESTION 4

The following table shows a few electromagnetic waves and their corresponding wavelengths. These electromagnetic radiations exhibit a dual nature.

TYPE OF RADIATION	WAVELENGTH (m)
X-rays	$2{,}11 \times 10^{-10}$
Ultraviolet light	$3{,}00 \times 10^{-7}$
Visible light	$5{,}13 \times 10^{-6}$

4.1 Explain what is meant by a dual nature of light. (2)

4.2 Which type of radiation from the table above:

4.2.1 Is known to cause skin cancer. (1)

4.2.2 Is used for bone imaging. (1)

4.3 Electromagnetic radiation with the energy of $3{,}88 \times 10^{-20}$ J is emitted by an unknown source.

4.3.1 Define a *photon*. (2)

4.3.2 Use a calculation and the table above to identify the type of radiation associated with this energy from an unknown source. (4)

[10]

QUESTION 5

Two charged spheres **A** and **B** are brought together to touch and then separated. After touching and separating, the charge on sphere **A** is $+5 \times 10^{-6}$ C.

5.1 State the *principle of conservation* of charge in words. (2)

5.2 What is the charge on sphere **B** after touching? (1)

5.3 Explain if the charge of $+5 \times 10^{-6}$ C exist. (2)

5.4 The charge on sphere **A** BEFORE touching was -2×10^{-6} C.

5.4.1 Calculate the initial charge on sphere **B**. (3)

5.4.2 Which sphere **A** or **B** gained electrons. (1)

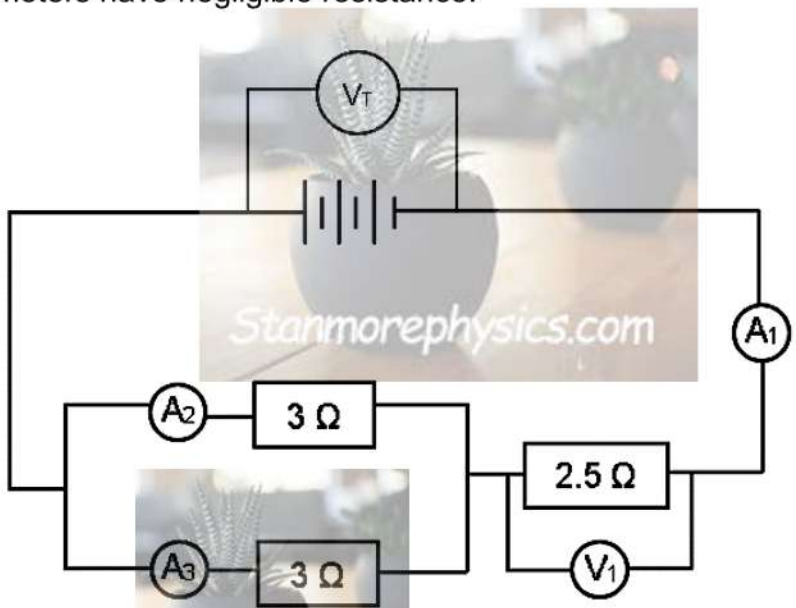
5.4.3 Calculate the number of electrons gained. (5)

[14]

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QUESTION 6

In the circuit diagram below, the potential difference across the battery and the readings on A_1, A_2 and A_3 are unknown. The reading on V_1 is 7,5 V. The connecting wires and the ammeters have negligible resistance.



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6.1 Define the term *potential difference*. (2)

6.2 Calculate

6.2.1 Equivalent resistance of the circuit. (4)

6.2.2 The reading on A_1. (3)

6.2.3 Potential difference(V_T) across the battery. (3)

6.3 What is the reading on A_2? (1)

The charge passing through the 2,5 Ω in 60 s is 180 C.

6.4 Calculate the amount of energy transferred in the 2,5 Ω. (3)

[16]

TOTAL: 75

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GRADE 10/GRAAD 10

TABLE 1: PHYSICAL CONSTANTS/TABEL 1: FISIESE KONSTANTES

NAME/NAAM	SYMBOL/SIMBOOL	VALUE/WAARDE
Speed of light in a vacuum *Spoed van lig in 'n vakuum*	c	$3,0 \times 10^{8}\ m \cdot s^{-1}$
Planck's constant *Planck se konstante*	h	$6,63 \times 10^{-34}\ J \cdot s$
Charge on electron *Lading op elektron*	e	$-1,6 \times 10^{-19}\ C$

TABLE 2: FORMULAE/TABLE 2: FORMULES

WAVES, SOUND AND LIGHT/*GOLWE, KLANK EN LIG*	
$v = f\lambda$	$f = \frac{1}{T}$
$E = hf \ / \ E = \frac{hc}{\lambda}$	

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ELECTRIC CIRCUITS/*ELEKTRIESE STROOMBANE*	
$Q = I \Delta t$	$\frac{1}{R_P} = \frac{1}{R_1} + \frac{1}{R_2} + \cdots \ldots$
$R_S = R_1 + R_2 + \ldots$	$V = \frac{W}{Q}$

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