EKURHULENI NORTH

JUNE EXAMINATION

2025

GRADE 10

PHYSICAL SCIENCES

JUNE EXAMINATION

PAPER 1 – Physics

MARKING GUIDELINES

Time: 2 Hr

Marks: 100 Marks

QUESTION 1:

1.1 B ✓✓ (2)

1.2 D ✓✓ (2)

1.3 C ✓✓ (2)

1.4 D ✓✓ (2)

1.5 C ✓✓ (2)

1.6 B ✓✓ (2)

1.7 C ✓✓ (2)

1.8 A ✓✓ (2)

[16]

QUESTION 2

2.1

Difference	Similarity
Amplitudes ✓	Wavelength ✓ Period Frequency Transverse **(Any one)**

(2)

2.2

2.2.1 A and B ✓
OR
C and D ✓
OR
B and C ✓
OR
A and D ✓ (1)

2.2.2 15 (mm) ✓ (1)

2.3 The <u>number of waves/pulses</u> passing a point <u>per second</u>. ✓✓ (2)

2.

4

2.4.1 $f=\frac{1}{T}$ ✓

$f=\frac{1}{1,5}$ ✓

$f=0,67\,Hz$ ✓ (3)

2.4.2

POSITIVE MARKING FROM 2.4.1 **<u>OPTION 1</u>**	**<u>OPTION 2</u>**
v = fλ ✓ v = (0,67)(0,1) ✓✓ v = 0,067 m·s^{-1} ✓	$v=\frac{\Delta x}{\Delta t}\vee v=\frac{distance}{time}$ ✓ $v=\frac{0,1}{1,5}$ $v=0,067\,m\cdot s^{-1}$

(4)

2.5

2.5.1 INCREASE ✓ (1)

2.5.2 NO CHANGE ✓ (1)

[15]

QUESTION 3

3.1 Wave in which the particles of the medium vibrate parallel to the direction of propagation (motion) of the wave. ✓✓ (2)

3.2

3.2.1 Rarefactions ✓ (1)

3.2.2 Compressions ✓ (1)

3.2.3 0,275 m ✓✓✓ (3)

3.2.4 $v=f\lambda$ ✓
$9=f\left(0,275\right)$ ✓
$f=32,73\,Hz$

$T = \frac{1}{f}$

$T = \frac{1}{32,73}$ ✓

$T = 0,03 s$ ✓ (5)

[12]

QUESTION 4

4.1

4.1.1 Infrared waves ✓ (1)

4.1.2 Radio waves **OR** microwaves ✓ (1)

4.2

4.2.1 Packet of energy found in light ✓✓ (2)

4.2.2

OPTION 1	**OPTION 2**
$c = f\lambda$ ✓ $3 \times 10^8 = f \times (650 \times 10^{-9})$ ✓ $f = 4,615 \times 10^{14} Hz$ $E = hf$ ✓ $E = (6,63 \times 10^{-34})(4,615 \times 10^{14})$ ✓✓ $E = 3,06 \times 10^{-19} J$ ✓	$E = \frac{hc}{\lambda}$ ✓✓ $E = \frac{(6,63 \times 10^{-34})(3 \times 10^8)}{(650 \times 10^{-9})}$ $E = 3,06 \times 10^{-19} J$ ✓

(6)

4.2.3 Laser light has high intensity and can penetrate soft tissue of humans ✓

This can lead to damage of the eye tissue ✓ (2)

[12]

QUESTION 5

5.1

5.1.1 The net charge of an isolated system remains constant during any physical process ✓✓ (2)

5.1.2 $Q = \frac{Q_1 + Q_2}{2}$

$Q = \frac{(-2,5 \times 10^{-6}) + (6 \times 10^{-6})}{2}$ (3)

$Q = 1,75 \times 10^{-6} C$ ✓

5.2

5.2.1 Tribo-electric effect ✓ (1)

5.2.2 Excess of electrons ✓ (1)

5.2.3 All charges in the universe consist of an integer multiple of the change on a single electron i.e. 1,6 x 10^{-19} C ✓✓ (2)

5.2.4 $Q = nq$ ✓

$-5 \times 10^{-9} = n \times (-1,6 \times 10^{-19})$ ✓

$n = 3,125 \times 10^{10}\ electrons \vee 31250000000\ electrons$ ✓ (3)

5.2.5 Water molecules are polar ✓, the positive sides of the water molecules will be attracted to the negatively charged ball. ✓ (2)

5.2.6 Neutral ✓ (1)

[15]

QUESTION 6

6.1 The rate of flow of charge ✓✓ (2)

6.2

6.2.1 V_2 ✓ (1)

6.2.2 V_1 ✓ (1)

6.2.3 V_1 ✓
Switch S must be CLOSED ✓ (2)

6.3 $Q = I\Delta t$ ✓
$Q = 1,5 \times (2,5 \times 60)$
$Q = 225C$ ✓ (4)

[10]

QUESTION 7

7.1

7.1.1 (a) V_1 = 24 V ✓ (1)

(b) A_1 = 0 (A) ✓ (1)

7.1.2

OPTION 1	**OPTION 2**
$\frac{1}{R_p}=\frac{1}{R_1}+\frac{1}{R_2}$ ✓	$R_p=\frac{product}{\sum ¿¿}$ ✓
$\frac{1}{R_p}=\frac{1}{8}+\frac{1}{8}$ ✓	$R_p=\frac{(8)(8)}{8+8}$ ✓
$R_p=4\Omega$	$R_p=4\Omega$
$R_T=R_s+R_p$ $R_T=8+4$ ✓ $R_T=12\Omega$ ✓	$R_T=R_s+R_p$ $R_T=8+4$ ✓ $R_T=12\Omega$ ✓

(4)

7.1.3 V = IR✓

24 = I(12) ✓

I = 2 A ✓ (3)

7.1.4 V= IR ✓

V = (2)(8) ✓

V = 16 V ✓ (3)

7.1.5 $A_2 = A_3$ ✓ (1)

7.1.6 $V_T=V_p+V_s$ ✓

$24=16+V_p$ ✓

$V_p=8V$ ✓ (3)

7.2

7.2.1 Resistance is directly proportional to the length of the conducting wire. ✓✓

OR

As the length of the wire increases, the resistance increases ✓✓ (2)

7.2.2 1,35 Ω ✓✓ (Range: 1,3 Ω to/tot 1,4 Ω) (2)

[20]

TOTAL: [100]