



education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 10

PHYSICAL SCIENCES: PHYSICS (P1)

JUNE 2024

MARKING GUIDELINES

MARKS: 75

These marking guidelines consist of 5 pages and a cognitive table.

QUESTION 1

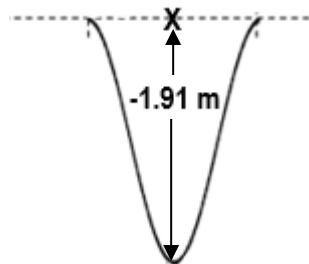
- 1.1 B ✓✓ (2)
- 1.2 A ✓✓ (2)
- 1.3 D ✓✓ (2)
- 1.4 D ✓✓ (2)
- 1.5 C ✓✓ (2)
- 1.6 A ✓✓ (2)
- 1.7 B ✓✓ (2)

[14]

QUESTION 2

- 2.1 The number of waves/wave pulses ✓ passing a point per second.✓ (2)
- 2.2. 2.2.1 A&B or A&D or B&C or B&D or C&D ✓ (any one) (1)
- 2.2.2 Crest ✓ (1)
- 2.3 2.3.1 Wavelength = $\frac{1}{2}$ (6) ✓
= 3 m ✓ (2)
- 2.3.2 Amplitude = 0,5(18) ✓
= 9 cm ✓
= 0,09 m ✓ (3)
- 2.4 2.4.1 Destructive interference ✓ (1)

2.4.2 Positive marking from question 2.3.2



Marking criteria:	
Trough	✓
Correct amplitude	✓

(2)
[12]

QUESTION 3

3.1 3.1.1 Temperature ✓ (1)

3.1.2 Speed of sound ✓ or
Time taken for the sound to travel. ✓ (1)

3.2
$$V = \frac{\Delta x/d}{\Delta t} \checkmark$$

$$= \frac{80}{0,236} \checkmark$$

$$= 338,98 \text{ m.s}^{-1} \checkmark$$
 (3)

3.3 The speed of sound increases/time taken for the sound to travel decreases/as the temperature increases. ✓✓ (2)

3.4 3.4.1 Wave A ✓ (1)

3.4.2 Wave A ✓ (1)

[9]**QUESTION 4**

4.1 Wave-particle duality ✓
No need for a medium to propagate. ✓
Speed of EM waves are constant at $3 \times 10^8 \text{ m.s}^{-1}$ in a vacuum.
Oscillation between alternating accelerating charges cause magnetic waves. (any two) (2)

4.2 4.2.1 Radio waves OR microwaves ✓ (1)

4.2.2 Infrared radiation/waves ✓ (1)

4.3 Gamma rays ✓ (1)

4.4 Gamma rays have the shortest wavelengths or the highest frequencies in the electromagnetic spectrum. ✓ (1)

4.5 4.5.1 Packet of energy found in light. ✓✓ (2)

4.5.2

Option 1	Option 2
$c = f\lambda$ $380 \times 10^8 = f (700 \times 10^{-9}) \checkmark$ $f = 5,428 \times 10^{16} \text{ Hz}$ $E = hf \checkmark$ $= 6,63 \times 10^{-34} (5,428 \times 10^{16}) \checkmark$ $= 3,598 \times 10^{-17} \text{ J} \checkmark$ $\approx 3,60 \times 10^{-17} \text{ J}$	$E = h \frac{c}{\lambda} \checkmark$ $= 6,63 \times 10^{-34} \checkmark \frac{380 \times 10^8}{700 \times 10^{-9}} \checkmark$ $= 3,598 \times 10^{-17} \text{ J} \checkmark$ $\approx 3,60 \times 10^{-17} \text{ J}$

(4)

[12]

QUESTION 5

5.1 The principle of conservation of charge states that the net charge of an isolated system remains constant during any physical process. ✓✓ (2)

5.2 EXCESS ✓ (1)

5.3 FROM B TO A ✓ (1)

5.4
$$Q = \frac{Q_1 + Q_2}{2} \checkmark$$

$$= \frac{5 \times 10^{-9} + (-2 \times 10^{-9})}{2} \checkmark$$

$$= +1,5 \times 10^{-9} \text{ C} \checkmark$$
 (3)

5.5

Option 1	Option 2
$Q = nq_e \checkmark$ $1,5 \times 10^{-9} = n \times 1,6 \times 10^{-19} \checkmark$ $n = 9,375 \times 10^9 \text{ electrons} \checkmark$	$n = \frac{Q}{e} \checkmark$ $= \frac{1,5 \times 10^{-9}}{1,6 \times 10^{-19}} \checkmark$ $= 9,375 \times 10^9 \text{ electrons} \checkmark$

(3)

5.6 When the charged plastic ruler is brought closer to the uncharged pieces of paper, the paper is polarised. ✓ The negative charges on the paper are repelled by the negative charges on the ruler. This leaves the side of the paper closest to the ruler positive. ✓

(2)
[12]

QUESTION 6

6.1 Current strength: rate of flow of charge ✓✓ (2)

6.2 6.2.1 $V_1 = 1,5 \times 4$
 $= 6 \text{ V}$ ✓✓ (2)

6.2.2 **Positive marking from question 6.2.1**

Option 1	Option 2
$V_{\text{Total}} = V_2 + V_3$ ✓ $6 = V_2 + 4,8$ ✓ $V_2 = 1,2 \text{ V}$ ✓	$I = \frac{V}{R}$ $= \frac{4,8}{8}$ $= 0,6 \text{ A}$ $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$ $= \frac{1}{6} + \frac{1}{3}$ $R_p = 2 \Omega$ $V_2 = I \times R$ ✓ $= 0,6 \times 2$ ✓ $= 1,2 \text{ V}$ ✓

(2)

6.3 **Positive marking from questions 6.2.1 and 6.2.2**

Option 1	Option 2
$I = \frac{V}{R}$ ✓ $= \frac{4,8}{8}$ ✓ $= 0,6 \text{ A}$ ✓	$I = \frac{V}{R}$ ✓ $= \frac{6}{10}$ ✓ $= 0,6 \text{ A}$ ✓

(3)

6.4 6.4.1 **Positive marking from questions 6.2.1, 6.2.2 and 6.3**

Option 1	Option 2
$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$ $= \frac{1}{6} + \frac{1}{3}$ $R_p = 2 \Omega$ $R_T = R_s + R_p$ $= 8 + 2$ ✓ $= 10 \Omega$ ✓	$R = \frac{V}{I}$ ✓ $= \frac{6}{0,6}$ ✓ $= 10 \Omega$ ✓

(3)

6.4.2 $Q = I \times t$ ✓
 $Q = (0,6)(20)$ ✓
 $Q = 12 \text{ C}$ ✓ (3)

6.5 DECREASES ✓ (1)

[16]

TOTAL: 75

Grade 10 – Marking Guidelines

SUBJECT:		Physical Sciences P1				ASSESSMENT TASK:			GRADE 10 - June exams			
QUESTION ANALYSIS GRID									2024			
QUESTION	Mark	Cognitive Levels				Topic			TOTAL	Difficulty Levels		
		1	2	3	4	Waves, Sound and Light	Electrostatics	Electric circuits		Easy	Moderate	Difficult
1.1	2	2				2			2		2	
1.2	2		2			2			2		2	
1.3	2			2		2			2			2
1.4	2		2			2			2			2
1.5	2		2			2			2		2	
1.6	2		2				2		2	2		
1.7	2			2				2	2		2	
Ques 1	14	2	8	4	0	10	2	2	14	2	8	4
2.1	2	2				2			2	2		
2.2.1	1		1			1			1	1		
2.2.2	1		1			1			1	1		
2.3.1	2			2		2			2			2
2.3.2	3			3		3			3		3	
2.4.1	1	1				1			1		1	
2.4.2	2		2			2			2			2
Ques 2	12	3	4	5	0	12	0	0	12	4	4	4
3.1.1	1		1			1			1		1	
3.1.2	1		1			1			1		1	
3.2	3			3		3			3		3	
3.3	2		2			2			2			2
3.4.1	1			1		1			1		1	
3.4.2	1			1		1			1		1	
Ques 3	9	0	4	5	0	9	0	0	9	0	7	2
4.1	2		2			2			2	2		
4.2.1	1	1				1			1		1	
4.2.2	1	1				1			1		1	
4.3	1		1			1			1		1	
4.4	1		1			1			1			1
4.5.1	2	2				2			2	2		
4.5.2	4			4		4			4			4
Ques 4	12	4	4	4	0	12	0	0	12	4	3	5
5.1	2	2					2		2	2		
5.2	1		1				1		1	1		
5.3	1			1			1		1	1		
5.4	3			3			3		3		3	
5.5	3				3		3		3	3		
5.6	2			2			2		2		2	
Ques 5	12	2	1	6	3	0	12	0	12	7	5	0
6.1	2	2						2	2	2		
6.2.1	2			2				2	2		2	
6.2.2	2			2				2	2		2	
6.3	3			3				3	3			3
6.4.1	3				3			3	3			3
6.4.2	3				3			3	3	3		
6.5	1			1				1	1			1
Ques 6	16	2	0	8	6	0	0	16	16	5	4	7
SUMMARY												
QUES 1	14	2	8	4	0	10	2	2	14	2	8	4
QUES 2	12	3	4	5	0	12	0	0	12	4	4	4
QUES 3	9	0	4	5	0	9	0	0	9	0	7	2
QUES 4	12	4	4	4	0	12	0	0	12	4	3	5
QUES 5	12	2	1	6	3	0	12	0	12	7	5	0
QUES 6	16	2	0	8	6	0	0	16	16	5	4	7
Total marks	75	13	21	32	9	43	14	18	75	22	31	22
Norm marks	75	11	23	34	7	41	15	19	75	23	29	23
Total %	100	17	28	43	12	57	19	24	100	29	41	31
Norm %	100	15	30	45	10	54	20	26	100	30	40	30