



GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION
GAUTENGSE DEPARTEMENT VAN ONDERWYS
PROVINCIAL EXAMINATION
PROVINSIALE EKSAMEN

JUNE / JUNIE 2018

GRADE / GRAAD 10

PHYSICAL SCIENCES
FISIESE WETENSKAPPE

PAPER / VRAESTEL 1

MEMORANDUM

7 pages / bladsye

GAUTENG DEPARTMENT OF EDUCATION
 GAUTENGSE DEPARTEMENT VAN ONDERWYS

 PROVINCIAL EXAMINATION
 PROVINSIALE EKSAMEN

 PHYSICAL SCIENCES / FISIIESE
 WETENSKAPPE
 (Paper / Vraestel 1)

QUESTION / VRAAG 1

- | | | | | | | | |
|-----|------|------|------|-----|------|-----|------|
| 1.1 | D ✓✓ | 1.2 | A ✓✓ | 1.3 | A ✓✓ | 1.4 | B ✓✓ |
| 1.5 | D ✓✓ | 1.6 | C ✓✓ | 1.7 | C ✓✓ | 1.8 | D ✓✓ |
| 1.9 | A ✓✓ | 1.10 | B ✓✓ | | | | |

[20]

QUESTION / VRAAG 2

- 2.1 The distance between two consecutive / successive points that are in-phase. ✓✓
 Die afstand tussen twee opeenvolgende punte in fase ✓✓ (2)

- 2.2 2.2.1 $\lambda = \frac{1,8}{12}$ ✓
 $\lambda = 0,15 \text{ m}$ ✓ (2)

2.2.2

POSITIVE MARKING FROM 2.2.1 POSITIEWE NASIEN VANAF 2.2.1
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$$v = f \cdot \lambda \quad \checkmark$$

$$0,225 = f(0,15) \quad \checkmark$$

$$f = 1,5 \text{ Hz} \quad \checkmark \quad (3)$$

- 2.3 2.3.1 Upwards / beweeg opwaarts ✓ (1)
 2.3.2 A and / en D ✓ (1)

2.4 2.4.1 OPTION / OPSIE 1

$$f = \frac{\text{no. of pulses}}{\text{time}} \checkmark \frac{\text{aantal pulse}}{\text{tyd}}$$

$$f = \frac{2}{0,8} \checkmark$$

$$f = 2,5 \text{ Hz} \checkmark$$

OPTION / OPSIE 2

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

$$f = \frac{1}{0,4} \checkmark$$

$$f = 2,5 \text{ Hz} \checkmark$$

(3)

2.4.2

POSITIVE MARKING FROM 2.4.1/
POSITIEWE NASIEN VANAF 2.4.1

$$v = f \cdot \lambda \checkmark$$

$$12 = 2,5 \cdot \lambda \checkmark$$

$$\lambda = 4,8 \text{ m} \checkmark$$

(3)

- 2.5 The maximum displacement / distance of disturbance of particles of the medium from rest / equilibrium position. $\checkmark\checkmark$

Die maksimum versteuring vanaf rus maksimum verplasing van deeltjies vanaf rus / of ekwilibrium posisie. $\checkmark\checkmark$

(2)

- 2.6 20 m $\checkmark\checkmark$

(2)

[19]**QUESTION / VRAAG 3**

- 3.1 A single disturbance that occurs in a medium wherein particles of the medium move perpendicular to the direction of propagation. $\checkmark\checkmark$ 'n Enkele versteuring in 'n medium waartydens die deeltjies van die medium loodreg beweeg tot die rigting van voortplanting van die puls $\checkmark\checkmark$ (2)
- 3.2 Superposition / (destructive) interference $\checkmark$ / Superposisie/ Destruktiewe interferensie $\checkmark$ (1)
- 3.3 Resultant amplitude/ Resulterende amplitude = $12 + (-8)$ $\checkmark$
= $(+) 4 \text{ cm}$ $\checkmark$ (2)
- 3.4 $v = \frac{d}{\Delta t}$ $\checkmark$
 $v = \frac{0,6}{1,5}$ $\checkmark$
 $v = 0,4 \text{ m} \cdot \text{s}^{-1}$ $\checkmark$ (3)
- 3.5 3.5.1 Longitudinal wave / longitudinale golf $\checkmark$ (1)

- 3.5.2 R – compression/ Verdigting ✓
S – rarefaction / verdunning ✓

(2)

3.5.3 $T = \frac{1}{f}$ ✓

$T = \frac{1}{100}$ ✓

$T = 0,01 \text{ s}$ ✓

(3)

- 3.6 Light travels faster than sound ✓✓ / lig beweeg vinniger as klank ✓✓

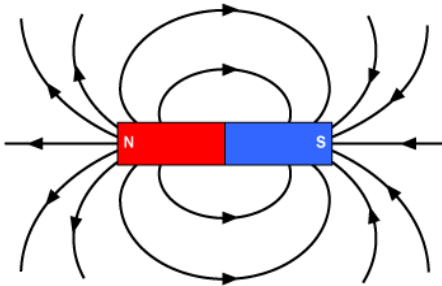
(2)

[16]**QUESTION / VRAAG 4**

- 4.1 A compass needle points along the earth's magnetic ✓ axis so that the north end of the magnet aligns with the earth's magnetic field. ✓ / 'n Kompas dui die Aarde ✓ se magnetise noord aan. Die naald wys in die rigting van die magnetiese noord. ✓

(2)

4.2



Direction of lines **in** at south pole, **out** at north pole / Rigting van lyne **in** by suidpool, **uit** by noordpool ✓✓

Correct shape for field pattern as shown / Korrekte vorm vir veldpatroon soos aangedui ✓

(3)

- 4.3 Yes / Ja ✓

(1)

[6]

QUESTION / VRAAG 5

5.1 Less than ✓ / minder as ✓

NEGATIVE MARKING / NEGATIEWE NASIEN

- Sphere B is positively charged, it has excess protons / has lost electrons ✓
- Sfeer B is positief gelaai, daar is minder elektrone / dit het elektrone verloor ✓

(2)

5.2 5.2.1 The net charge ✓ of an isolated system remains constant ✓ during any physical process.Die netto lading ✓ van 'n geïsoleerde sisteem bly konstant ✓ gedurende enige fisiese proses.

(2)

5.2.2 C to / na B ✓

(1)

5.2.3 - sphere C has a negative charge, thus has excess electrons which are shared equally ✓ only electrons can flow ✓

- sfeer C het 'n negatiewe lading, daar is dus 'n oorvloed elektrone wat gelyk versprei is. ✓ net elektrone mag beweeg ✓

(2)

5.2.4

$$\begin{aligned}
 Q_B = Q_C &= \frac{Q_{\text{net}}}{2} \quad \checkmark \\
 &= \frac{-6 \times 10^{-9} + 2 \times 10^{-9}}{2} \quad \checkmark \\
 &= -2 \times 10^{-9} \text{ C} \quad \checkmark
 \end{aligned}$$

(3)

5.2.5 $n = \frac{\Delta Q}{q_e} \quad \checkmark$

$$n = \frac{-2 \times 10^{-9} - (-6 \times 10^{-9})}{1,6 \times 10^{-19}} \quad \checkmark \quad \text{or / of} \quad \frac{-2 \times 10^{-9} + 6 \times 10^{-9}}{-1,6 \times 10^{-19}}$$

$$n = 2,5 \times 10^{10} \text{ electrons / elektrone} \quad \checkmark$$

(3)

[13]

QUESTION / VRAAG 6

- 6.1 6.1.1 Radio waves/ radiogolwe ✓ (1)
- 6.1.2 Radio waves have a longer wavelength and can be transmitted over long distances./ Radiogolwe het 'n langer golflengte en kan oor 'n lang afstand beweeg. ✓ (1)
- 6.2 6.2.1 A particle of light energy. / elementêre deeltjie (kragdraer) van ligenergie ✓✓ (2)
- 6.2.2 $3 \times 10^8 \text{ m.s}^{-1}$ ✓✓ (2)
- 6.2.3 $E = \frac{h.c.}{\lambda}$ ✓
 $1,46 \times 10^{-24} = \frac{6,63 \times 10^{-34} \cdot 3 \times 10^8}{\lambda}$ ✓
 0,136 m ✓ (3)
- 6.3 Decrease / Verminder ✓✓ (2)

NEGATIVE MARKING / NEGATIEWE NASIEN

- Wavelength is inversely proportional to energy / penetrating ability. /
- Golflengte in omgekeerd eweredig aan energie / penetrasievermoë ✓✓

(2)
[13]

QUESTION / VRAAG 7

- 7.1 7.1.1 Energy transferred per coulomb of charge. ✓✓/ Energie oorgedra per Coulomb lading ✓✓

OR

Is the work done in moving a unit charge ✓ between two points. ✓
 Die werk verrig om 'n eenheid lading ✓ tussen twee punte te beweeg. ✓

(2)

7.1.2

$$V = \frac{W}{Q} \checkmark$$

$$V = \frac{90}{20} \checkmark$$

$$V = 4,5 \text{ V} \checkmark$$

(3)

7.1.3

POSITIVE MARKING FROM 7.1.2 / POSITIEWE NASIEN VANAF 7.1.2

$$p.d = \frac{4,5}{3} \checkmark = 1,5 \text{ V} \checkmark$$

(2)

7.2.1

$$I = \frac{Q}{\Delta t} \checkmark$$

$$= \frac{30}{40} \checkmark$$

$$= 0,75 \text{ A} \checkmark$$

7.2.2

POSITIVE MARKING FROM 7.1.2 AND 7.2.1 / NEGATIEWE NASIEN

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} \checkmark$$

$$\frac{1}{R_p} = \frac{1}{12} + \frac{1}{12} \checkmark$$

$$R_p = 6\Omega \checkmark$$

(3)

7.3 Dimmer $\checkmark$ / Dowwer $\checkmark$

(1)

7.4

NEGATIVE MARKING/ NEGATIEWE NASIEN

- The effective resistance will increase $\checkmark$ and the total current will remain the same $\checkmark$ /
- Die effektiewe weerstand sal toeneem $\checkmark$ en die totale stroomsterkte bly dieselfde $\checkmark$

(2)

[16]

TOTAL SECTION B / TOTAAL AFDELING B: 80

TOTAL / TOTAAL: 100