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DEPARTMENT OF
EDUCATION

NATIONAL

SENIOR CERTIFICATE

GRADE/*GRAAD* 10

PHYSICAL SCIENCES/*FISIESE WETENSKAPPE*

CONTROL TEST MARKING GUIDELINES/*KONTROLE TOETS NASIENRIGLYNE*

13 MARCH/*MAART* 2024

Examplar Physics.com

MARKS/*PUNTE*: 100

THIS MARKING GUIDELINE CONSISTS OF 6 PAGES/*HIERDIE NASIENRIGLYNE BESTAAN UIT 6 BLADSYE*

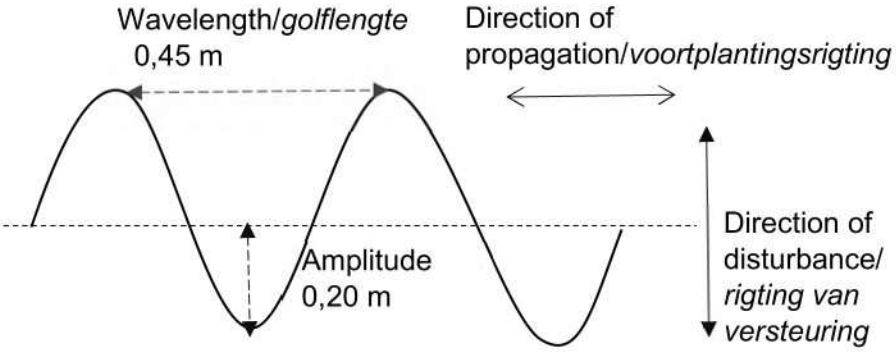
Question/*Vraag* 1

1.1 B ✓✓ (2)
1.2 D ✓✓ (2)
1.3 C✓✓ (2)
1.4 D✓✓ (2)
1.5 C✓✓ (2)
[10]

Question/*Vraag* 2

2.1. A transverse wave is a wave in which the particles of the medium vibrate perpendicular to the direction of motion of the wave.✓✓/ *'n Transversale golf is 'n golf waarin die deeltjies van die medium loodreg op die bewegingsrigting van die golf vibreer.* (2)

2.2.



Criteria for marking/*merk kriteria*	
Two wavelengths/*twee golflengtes*	✓
Amplitude and wavelength/*amplitude en golflengte*	✓
Direction of propagation wave/*voortplantingsrigting van golf*	✓
Direction of disturbance/*rigting van verstuering*	✓

(4)

2.3. $v = f\lambda$✓

$0{,}25$✓ $= f(0{,}45)$ ✓

$f = 0{,}56\ Hz$ ✓ (4)

2.4. $T = \frac{1}{f}$✓

$= \frac{1}{0{,}56}$ ✓

$= 1{,}79\ s$ ✓ (3)

2.5.1. INCREASES ✓ */ NEEM TOE* (1)

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2.5.2. NO CHANGE ✓/ *GEEN VERANDERING* (1)

[15]

Question/*Vraag* 3

3.1. Wave in which the particles of the medium vibrate parallel to the direction of propagation(motion) of the wave.✓✓ /*Golf waarin die deeltjies van die medium parallel aan die voortplantingsrigting (beweging) van die golf vibreer*. (2)

3.2.1. Rarefactions ✓/ *Verdunning* (1)

3.2.2. Compressions✓/*Verdigting* (1)

3.2.3. 0,275 m✓✓ (2)

3.2.4. $v = f\lambda$✓
9✓ $= f(0{,}275)$✓
$f = 32{,}73\ Hz$
$\therefore T = \frac{1}{f}$
$= \frac{1}{32{,}73}$✓ $= 0{,}03\ s$ ✓ (5)

[11]

Question/*Vraag* 4

4.1.1 $\mathrm{v} = \mathrm{f}\lambda$✓

$= 256 \times 1{,}33$✓

$= 340{,}48\ \mathrm{m} \cdot \mathrm{s}^{-1}$ ✓ (3)

4.1.2.

4.1.2.1 INCREASES ✓/ *NEEM TOE* (1)

4.1.2.2. REMAIN UNCHANGED ✓/*BLY DIESELFDE* (1)

4.1.2.3. DECREASE ✓/ *NEEM AF* (1)

4.2. A pure note has uniform frequency and wavelengths✓; while a noise have irregular frequencies, amplitudes and wavelengths✓. / *'n Suiwer noot het eenvormige frekwensie en golflengtes; terwyl 'n geraas onreëlmatige frekwensies, amplitudes en golflengtes het* (2)

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4.3.1. Ultrasound. ✓/*Ultraklank* (1)

4.3.2. Animals can hear sound of this frequency ✓and move to a place that is not affected by the earthquake. ✓/ *Diere kan klank van hierdie frekwensie hoor en beweeg na 'n plek wat nie deur die aardbewing geraak word nie*. (2)

4.3.3. Human beings may study the movement of animals✓ and react to the sudden change of place by the animals as a warning sign. ✓ / *Mense kan die beweging van diere bestudeer en die skielike verandering van plek deur die diere as 'n waarskuwingsteken sien en daarop reageer.* (2)

[13]

Question/*Vraag* 5

5.1. The source of electromagnetic waves is an accelerating charge ✓✓ / *Die bron van elektromagnetiese golwe is 'n versnellende lading.* (2)

5.2. Wave model✓ and particle model. ✓/ *Golfmodel en deeltjiemodel* (2)

5.3.1 Gamma rays. ✓ /*Gamma strale*

They have highest frequency/shortest wavelength; ✓ therefore more energy to be able to penetrate through matter. ✓ / *Hulle het die hoogste frekwensie/kortste golflengte; dus meer energie om deur materie te kan penetreer.* (3)

Stanmorephysics.com

5.4.1. Uses of visible light/*gebruike van sigbare lig*:

- ability for humans to see; / *vermoë vir mense om te sien*
- used in photography; /*word gebruik in fotografie*
- drying clothes or anything; /*droogmaak van klere of ander voorwerpe*
- fibre optic communications; /*optiese vesel kommunikasie*
- electronic devices, etc /*elektroniese toestelle*

(any one/enige een) ✓ (1)

5.4.2. Uses of microwaves/*gebruike van mikrogolwe*:

- used in cooking/ovens/defrosting /*om te kook/in oonde/ontvries kos*
- dry and cure plywood / *droog en behandeling van laaghout*
- in communication systems, etc/ in kommunikasie sisteme

(any one/enige een) ✓ (1)

5.5.1. X-ray✓ / *X-straal* (1)

5.5.2. X-ray has a high frquency and can penetrate into soft tissues but not bones. ✓/ *X-straal het 'n hoë frekwensie en kan sagte weefsels binnedring, maar nie bene nie.* (1)

5.5.3. X-ray can/*X-strale kan*:
Damage living tissue / *lewendige weefsel beskadig*
Cause cancer / *kanker veroorsaak*
(Any one/enige een) ✓ (1)

5.6. $c = f\lambda$ ✓
3×10^8 ✓ $= 3f$ ✓
$f = 1 \times 10^8\ Hz$ ✓ (4)

[16]

Question/*Vraag* 6

6.1. A photon is a packet of energy found in light. ✓✓ /*'n Foton is 'n pakkie energie wat in lig gevind word.* (2)

6.2. $E = h\frac{c}{\lambda}$ ✓
$E = (6{,}63 \times 10^{-34})$ ✓ $\frac{3\times10^8\checkmark}{1{,}5\times10^{-11}\checkmark}$
$= 1{,}33 \times 10^{-1}$ J ✓ (5)

6.3. INCREASES ✓/ *TOENEEM* (1)

[8]

Question/*Vraag* 7

7.1.1. The net charge of an isolated system✓ remains constant during any physical process✓ / *Die netto lading van 'n geïsoleerde stelsel bly konstant gedurende enige fisiese proses.* (2)

7.1.2. $Q = \frac{Q_1+Q_2}{2}$ ✓
$= \frac{(-2{,}5\times10^{-6})+(+6\times10^{-6})\checkmark\checkmark}{2}$
$= 1{,}75 \times 10^{-6}$C ✓ (4)

7.2.

7.2.1. Tribo-electric effek ✓/ *Tribo-elektriese effek* (1)

7.2.2. Excess of electrons ✓ / *Oormaat van elektrone* (1)

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7.2.3. All charges in the universe consist of an integer multiple of the charge on one electron i.e. 1,6 x 10^{-19} C. ✓✓/ *Alle ladings in die heelal bestaan uit 'n heelgetal veelvoud van die lading op een elektron d.w.s. 1,6 x 10^{-19} C* (2)

7.2.4. $Q = nq$✓

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

$n = -3{,}125 \times 10^{10}$

$n = 3{,}125 \times 10^{10}$ $electrons/elektrone$✓or/of 31 250 000 000 excess electrons/*oormaat elektrone*. (4)

7.2.5. Water molecules are polar✓; the positive sides of the water molecules will be attracted to the negatively charged ball. ✓/ *watermolekules is polêr, die positiewe gedeeltes van die watermolekules sal aangetrek word deur die negatief gelaaide bal.* (2)

7.2.6. Neutral ✓/*neutraal* (1)

[17]

Question/*Vraag* 8

8.1.1. The rate of flow of charge. ✓✓ / *Die tempo van vloei van lading* (2)

8.2.1. V_2 ✓ (1)

8.2.2. V_1 ✓ (1)

8.2.3. V_1✓ Switch S must be closed✓/*Skakelaar S moet gesluit wees.* (2)

8.3. $Q = I\Delta t$✓

$= 1{,}5$✓ $\times (2{,}5 \times 60)$✓

$= 2\ 25\ C$ ✓ (4)

[10]

TOTAL/*TOTAAL*:100

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