education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT
PROVINSIALE ASSESSERING

GRADE/*GRAAD* 10

PHYSICAL SCIENCES: PHYSICS (P1)
FISIESE WETENSKAPPE: FISIKA (V1)
NOVEMBER 2024
MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 100

These marking guidelines consist of 6 pages.
Hierdie nasienriglyne bestaan uit 6 bladsye.

QUESTION/*VRAAG* 1

1.1 C ✓✓ (2)
1.2 C ✓✓ (2)
1.3 B ✓✓ (2)
1.4 B ✓✓ (2)
1.5 D ✓✓ (2)
1.6 A ✓✓ (2)
1.7 A ✓✓ (2)
[14]

QUESTION/*VRAAG* 2

2.1 A wave in which the particles of the medium vibrate at right angles to the direction of motion of the wave. ✓✓
'n Golf waarin die deeltjies van die medium reghoekig tot die bewegingsrigting van die golf vibreer. (2)

2.2 0,4 m ✓ (1)

2.3 T = 8 s ✓ (1)

2.4 2.4.1 Wavelength/*Golflengte* ✓ (1)

2.4.2 **POSITIVE MARKING FROM QUESTION 2.3**
POSITIEWE NASIEN VANAF VRAAG 2.3

Marking guidelines
Nasien riglyne:
- Formula/*Formule*: $f = \frac{1}{T}$ ✓
- Substitute/*Substitusie van* T ✓
- Formula/*Formule*: v = fλ ✓
- Substitute/*Substitusie van* f and/*en* λ ✓
- Final answer/*Finale antwoord*: 0,11 m.s^{-1}✓

$f = \frac{1}{T}$ ✓
$= \frac{1}{8}$ ✓
= 0,125 Hz

v = fλ ✓
= (0,125)(0,9) ✓
= 0,11 m.s^{-1} ✓
(5)

2.5 2.5.1 Longitudinal/*Longitudinaal* ✓ (1)

2.5.2 B ✓ It has a greater amplitude./*Groter amplitude* ✓ (2)

2.5.3 Above/*Bo* 20 kHz ✓ (1)

2.5.4 **Any one/*Enige een:***
- Monitor a fetus/*Monitoring van 'n fetus*.
- Cleaning of medical equipment/*Skoonmaak van mediese toerusting*
- Diagnosis of tumors and/or gallstones/*Diagnoseer gewasse en/of galstene*.
- Evaluate bloodflow/*Evalueer bloedvloei.* (1)

[15]

QUESTION/*VRAAG* 3

3.1 Accelerating charges/*versnelde lading.* ✓ (1)

3.2 The behaviour of electromagnetic radiation can best be explained using a wave model and some aspects can best be explained using a particle model. ✓✓
Sommige aspekte van die gedrag van elektromagnetiese straling die beste beskryf kan word deur 'n golfmodel te gebruik en ander aspekte kan die beste beskryf word deur 'n deeltjiemodel te gebruik. (2)

3.3 3.3.1 X – rays/*X - Strale* ✓ (1)

3.3.2 Radio waves/*Radiogolwe* ✓ (1)

3.3.3 Gamma rays/*Gamma strale* ✓ (1)

3.4 $E = \frac{h.c}{\lambda}$ ✓
$= \frac{6{,}63\times10^{-34}.\ 3\times10^{8}}{2{,}1 \times 10^{-2}}$ ✓
$= 9{,}47 \times 10^{-24}$ J ✓ (3)
[9]

QUESTION/*VRAAG* 4

4.1 $Q = \frac{Q_D+Q_E}{2}$ ✓
$+5x10^{-9} = \frac{(-2\times10^{-9})+ Q_E}{2}$ ✓
$Q_E = + 12 \times 10^{-9}$ C ✓ (3)

4.2 $\Delta Q = +5 \times 10^{-9} - (-2 \times 10^{-9})$ ✓ **OR/*OF*** $\Delta Q = +5 \times 10^{-9} - (+12 \times 10^{-9})$ ✓
$= 7 \times 10^{-9}$ C $= - 7 \times 10^{-9}$ C

$n = \frac{\Delta Q}{q}$

$= \frac{7 \times 10^{-9}\ ✓}{1{,}6 \times 10^{-19}\ ✓}$ **OR/*OF*** $= \frac{-7 \times 10^{-9}\ ✓}{-1{,}6 \times 10^{-19}\ ✓}$

$= 4{,}37 \times 10^{10}$ electrons/*elektrone* ✓ (4)

4.3 D to/*na* E ✓ (1)
[8]

QUESTION/VRAAG 5

5.1 Potential difference across the ends of a conductor is the energy transferred per unit electric charge flowing through it. ✓✓
Potensiaalverskil oor die ente van 'n geleier as die energie oorgedra per eenheidslading wat daardeur vloei. (2)

5.2 5.2.1

OPTION/*OPSIE* 1	**OPTION/*OPSIE* 2**
$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$ ✓ $= \frac{1}{2} + \frac{1}{2}$ ✓ Rp = 1 Ω R_T = 1+4 ✓ = 5 Ω ✓	Rp = $\frac{R_1R_2}{R_1+R_2}$ ✓ = $\frac{(2)(2)}{2+2}$ ✓ = 1 Ω R_T = 1 + 4✓ = 5 Ω ✓

(4)

5.2.2 Q = IΔt ✓
= (3)(120) ✓
= 360 C ✓ (3)

5.2.3 V = $\frac{W}{Q}$ ✓
= $\frac{5400}{360}$ ✓
= 15 V ✓ (3)

5.3 DECREASE/*AFNEEM* ✓ (1)

5.4 If a wire is connected from X to Y in the circuit, the circuit becomes a series circuit with only one resistor (4 Ω).
Total Resistance will decrease. ✓
Current will increase ✓ and Potential difference (reading on V_1) will decrease.
As 'n draad van X na Y in die stroombaan gekoppel is, word die stroombaan 'n seriestroombaan met slegs een weerstand (4 Ω).
Totale weerstand sal afneem.
Stroomsterkte sal toeneem en Potensiële verskil (lesing op V_1) sal afneem. (2)
[15]

QUESTION/*VRAAG* 6

6.1 The total distance travelled per total time. ✓✓
Die totale afstand beweeg per totale tyd. (2)

6.2 $v = \frac{x/d}{t}$ ✓
$= \frac{100}{65}$ ✓
$= 1{,}54\ m.s^{-1}$ ✓ (3)
[5]

QUESTION*VRAAG* 7

7.1 The rate of change of velocity. ✓✓
Die tempo van verandering van snelheid. (2)

7.2 $\frac{84}{3{,}6}$ **OR/*OF*** $\frac{84 \times 1000}{3600}$
$23{,}33\ m.s^{-1}$ ✓ (1)

7.3 $v_f = v_i + a\Delta t$ ✓
$25 = 0 + 2t$ ✓
$\Delta t = 12{,}5\ s$ ✓ (3)

7.4 Traffic car/*Verkeersmotor*: $\Delta x = v_i\Delta t + ½\ at^2$ ✓
$= (0)(12{,}5) + ½\ (2)(12{,}5)^2$ ✓
$\Delta x = 156{,}25\ m$ ✓

Taxi: $\Delta x = v_i\Delta t + ½\ at^2$
$= (23{,}33)(12{,}5) + ½\ (0)(12{,}5)^2$
$\Delta x = 291{,}63\ m$ ✓
The taxi is still ahead/*Die taxi is nog steeds voor*. ✓ (5)
[11]

QUESTION/*VRAAG* 8

8.1 0,8 s ✓ (range: 0,8 – 1 s) (1)

8.2 12,5 $m.s^{-1}$ ✓ (1)

8.3 a = gradient of the graph/*gradient/helling van grafiek* ✓
$= \frac{12,5-0 \checkmark}{5,8-0,8 \checkmark}$ (any other gradient points/*enige ander gradient punte*)
= 2,5 $m.s^{-2}$ ✓ (4)

8.4 Displacement = area under the graph ✓
Verplasing = oppervlak onder die grafiek
= (½ (5,8 – 0,8) × 12,5) ✓ + (12,5 × (8 – 5,8)) ✓
= 58,75 m ✓ (range: 56,25 – 59 m) (4)
[10]

QUESTION/*VRAAG* 9

9.1 The energy it has because of its position (in the gravitational field relative to some reference point.) ✓✓
Die energie wat dit het as gevolg van sy posisie (in die gravitasieveld met betrekking tot 'n verwysingspunt.) (2)

9.2 E_p = 0,30 J ✓✓ (2)

9.3 mass/*massa* = 50 g = 0,05 kg ✓
E_p = 0,30 J
mgh = 0,30 ✓
0,05 × 9,8 × h = 0,30 ✓
h = 0,61 m ✓ (4)

9.4 $M_{E\ at\ A} = M_{E\ at\ B}$
$(E_k + E_p)_A = (E_K + E_P)_B$ } any one/*enige een* ✓
$0,3 + 0 = 0 + ½ mv^2$
$0,3 = ½ \times 0,05 \times v^2$ ✓
v = 3,46 $m \cdot s^{-1}$ ✓ (3)

9.5 The total energy of an isolated system remains constant. ✓✓
Die totale energie in 'n geïsoleerde sisteem bly konstant. (2)
[13]

TOTAL/*TOTAAL*: 100