GAUTENG DEPARTMENT OF EDUCATION

PROVINCIAL EXAMINATION

JUNE 2019

GRADE 10

PHYSICAL SCIENCES

PAPER 1

MARKING GUIDELINE

6 pages

GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION

PHYSICAL SCIENCES
(Paper 1)

MARKING GUIDELINE

QUESTION 1: MULTIPLE CHOICE QUESTIONS

1.1 C ✓✓

1.2 A ✓✓

1.3 A ✓✓

1.4 C ✓✓

1.5 C ✓✓

1.6 B ✓✓

1.7 C ✓✓

1.8 D ✓✓

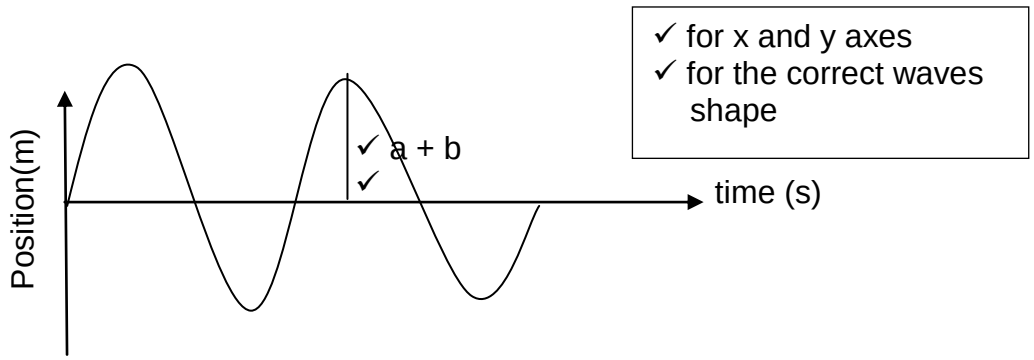
1.9 A ✓✓

1.10 C ✓✓ **[20]**

QUESTION 2

2.1 2.1.1 The distance between two consecutive / successive points in phase. ✓✓ (2)

2.1.2



(4)

2.1.3 (Constructive) interference / superposition ✓✓ (2)

2.1.4 When two waves meet at a point, the resultant disturbance is the algebraic sum of the two waves. ✓✓ (2)

2.2 2.2.1 The time taken to complete a single oscillation. ✓✓ (2)

2.2.2 Downwards ✓✓

2.3 2.3.1 $f = \frac{1}{T}$ ✓

$= \frac{1}{5}$ ✓ ✓ $= 0,2\ Hz$ ✓ (4)

2.3.2 $v = \lambda f$ ✓

$= 1,5$ ✓ $\times 0,2$ ✓

$= 0,3\ m \cdot s^{-1}$ ✓ (4)

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QUESTION 3

3.1 A single disturbance that occurs in a medium. ✓✓ (2)

3.2 3.2.1 Wavelength ✓ (1)

3.2.2 Compression ✓ (1)

3.3 3.3.1 $v = f\lambda$ ✓

342✓= f (9/1000) ✓

f = 38 000 Hz = 38 kHz ✓

38 kHz > 20 kHz

∴ humans cannot hear this sound.✓ (5)

3.3.2 ultrasound ✓ (1)

3.4 Distance from device to building B

s = v x t✓

= 340 x 0,75 ✓ (1, 5 / 2)

= 255 m✓

Distance from device to building A

s = 340 x 0,5 ✓ (1/2)

= 170 m✓

∴Distance between two buildings :255 + 170 = 425 m✓ (6)

[16]

QUESTION 4

4.1 4.1.1 Radio and TV broadcast / Communication / Locating information about our universe. ✓

ANY ONE (1)

4.1.2 $E = h.f$ ✓

$E = \frac{6,63\ x10^{-34}}{0,14}(3\ x\ 10^{8})$ ✓✓

E = J ✓ (4)

4.2 4.2.1 $3{,}0 \times 10^{8}\ m{\cdot}s^{-1}$ ✓ (1)

4.2.2 $c = \lambda f$✓

3×10^{8}✓ $= 1{,}5 \times 10^{-11}$✓ $\times f$

$f = 2 \times 10^{19} Hz$✓ (4)

4.3 They are a high-frequency / energy type of electromagnetic radiation with a relatively high penetrating ability. ✓✓ (2)

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QUESTION 5

5.1 5.1.1 The spheres are carrying opposite charges✓ and will attract each other✓ (2)

5.1.2 Sphere A ✓ (1)

5.2 5.2.1 $Q_{new} = \frac{Q_A + Q_B}{2}$✓

$= \frac{-8 + 20}{2}$ ✓

$= +6\ C$✓ (3)

5.2.2 Repulsion✓, the spheres are now carrying the same charge, they are both positively / like charged✓ and they repel each other since like charges repel. (2)

5.2.3 Every charge in the universe is a scalar multiple of the charge of a single electron. ✓✓ (2)

5.2.4 n = $\frac{\Delta Q}{e}$ ✓

n = $\frac{6-20}{-1{,}6\ x\ 10^{-19}}$ ✓✓ OR n = $\frac{6-(-8)}{1{,}6\ x\ 10^{-19}}$ ✓✓

n = $8{,}75\ x\ 10^{19}$ electrons ✓ (4)

[14]

QUESTION 6

6.1 6.1.1 The voltage across the terminals of a battery / cell when no current is flowing. ✓✓

ACCEPT

The maximum energy that a battery / cell can dissipate per coulomb of charge. ✓✓ (2)

6.1.2 $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$ ✓

$= \frac{1}{6} + \frac{1}{4}$ ✓

$= \frac{5}{12}$

$R = 2,4\ \Omega$ ✓✓ (3)

6.1.3 $I = 5 - 3$ ✓ $= 2\ A$ ✓ (2)

6.2 6.2.1 $R = R_1 + R_2 + R_3$ ✓

$= 5 + 7 + 8$ ✓

$= 20\ \Omega$ ✓ (3)

6.2.2 $V = 4 - (1,6 + 1)$ ✓ $= 1,4\ V$ ✓ (2)

6.2.3 0,2 A ✓, the current flowing through resistors in series is the same. ✓ (2)

6.3 $I = \frac{Q}{\Delta t}$ ✓

$= \frac{48}{120}$ ✓

$= 0,4\ A$ ✓ (3)
[17]

TOTAL: 100