



**GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION
NOVEMBER 2020**

GRADE 10

**PHYSICAL SCIENCES (PHYSICS)
PAPER 1**

MEMORANDUM

6 pages

QUESTION 1: MULTIPLE CHOICE QUESTIONS

- 1.1 C ✓ ✓
1.2 D ✓ ✓
1.3 B ✓ ✓
1.4 C ✓ ✓
1.5 C ✓ ✓

[10]

QUESTION 2

- 2.1 **NEGATIVE MARKING**
TRANSVERSE ✓

The disturbance of the particles of the medium are perpendicular to the direction of propagation. ✓ ✓ (3)

- 2.2 P✓ (1)

- 2.3 2.3.1 Wavelength = 100 mm = 10 cm = 0,1 m✓ (1)

- 2.3.2 $T = 1,5 \text{ s}$ ✓ (1)

- 2.3.3 $f = 1 / T = 1 / 1,5 = 0,67 \text{ Hz}$

$v = f \times \text{wavelength}$ ✓
 $v = (0,67) (0,1)$ ✓
 $v = 0,067 \text{ m} \cdot \text{s}^{-1}$ ✓ (3)

[9]

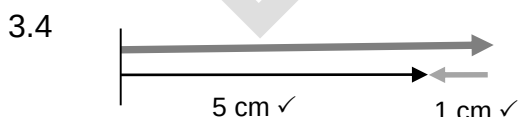
QUESTION 3

- 3.1 $150 \text{ m} + 25 \text{ m} = 175 \text{ m}$ ✓ (1)

- 3.2 $\Delta x = 125 \text{ m east}$ ✓ (1)

- 3.3 3.3.1 Displacement is the change in position of the object ✓ ✓ (2)

- 3.3.2 Physical quantity that has magnitude and direction ✓ ✓ (2)



Displacement = 125 m ✓
due east ✓

Marking grid for scale drawing	
Criteria	Mark
Correct measurements for 50 m and 25 m	✓✓
Correct measurement for displacement	✓✓

(4)
[10]

QUESTION 4

$$4.1.1 \quad V_{AB} = \frac{\Delta x}{\Delta t} = \frac{6}{2} = 3 \text{ m.s}^{-1} \checkmark \checkmark \checkmark \quad (3)$$

$$4.1.2 \quad V_{CD} = \frac{\Delta x}{\Delta t} = \frac{18}{2} = 9 \text{ m.s}^{-1} \checkmark \checkmark \quad (2)$$

$$4.2 \quad a = \frac{\Delta v}{\Delta t} = \frac{9-3}{5-1} = 1,5 \text{ m.s}^{-2} \checkmark$$

OR $a = \frac{\Delta v}{\Delta t} \checkmark$
 $= \frac{9-3}{4} \checkmark$
 $= 1,5 \text{ m.s}^{-2} \checkmark$

(4)

4.3 The change (increase) in displacement in each (consecutive) interval is constant (6 m) $\checkmark$ (2)

4.4.1 The car is moving with constant/uniform velocity / acceleration is zero $\checkmark \checkmark$ (1)

$$4.4.2 \quad \text{gradient} = \frac{\Delta v}{\Delta t} = \left(\frac{4,8 - 0}{25 - 0} \right) = 0,192 \text{ m.s}^{-2} \checkmark \checkmark \checkmark \quad (3)$$

4.4.3 Time interval: 0 to 25 s and 450 s to 510 s $\checkmark \checkmark$ (2)

[17]

QUESTION 5

5.1 The energy that an object has due to its vertical height above the surface of the earth. ✓ ✓ (2)

5.2 $E_p = mgh$ ✓
 $E_p = 1 (9,8) 35$ ✓
 $E_p = 343 \text{ J}$ ✓ (3)

5.3 In a closed/isolated system, the total mechanical energy remains constant/ is conserved ✓ ✓ (2)

5.4 $E_{\text{mec}}(x) = E_{\text{mec}}(y)$

$$(E_p + E_k)_x = (E_p + E_k)_y$$

$$(mgh + \frac{1}{2}mv^2)_x = (mgh + \frac{1}{2}mv^2)_y$$

$$343 + 0 \checkmark = 0 + \frac{1}{2}(1) v^2 \checkmark$$

$$v = 26,19 \text{ m}\cdot\text{s}^{-1} \checkmark$$

(4)
[11]

QUESTION 6

6.1 NEGATIVE MARKING

Removed ✓

It has a positive charge. ✓✓ (3)

6.2 6.2.1 Every charge in the universe is an integer multiple of the elementary charge. ✓ ✓ (2)

6.2.2 $Q_{\text{new}} = \frac{Q_{\text{net}}}{2}$ ✓

$Q_{\text{new}} = (9 \times 10^{-9} + 0) / 2$ ✓

$Q_{\text{new}} = 4,5 \times 10^{-9} \text{ C}$ ✓ (3)

6.2.3 $n = \frac{\Delta Q}{e}$ ✓

$n = (4,5 \times 10^{-9} - 0) / 1,6 \times 10^{-19}$ ✓

$n = 2,8125 \times 10^{10} \text{ electrons}$ ✓

OR

$n = \frac{\Delta Q}{e}$ ✓

$n = (4,5 \times 10^{-9} - 9 \times 10^{-9}) / -1,6 \times 10^{-19}$ ✓

$n = 2,8125 \times 10^{10} \text{ electrons}$ ✓

(4)
[12]

QUESTION 7

7.1 A charge of 5 C passes through a point per unit time or in one second. ✓✓ (2)

7.2 $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$ ✓

$$\frac{1}{R_p} = \frac{1}{4} + \frac{1}{6} \quad \checkmark$$

$$\frac{1}{R_p} = \frac{12}{5}$$

$R_p = 2,4 \, \Omega$ ✓

(3)

7.3 $I_T = I_2 + I_3$ ✓

$$5 = 3 + I_3 \quad \checkmark$$

$$I_3 = 2 \, \text{A} \quad \checkmark$$

(3)

7.4 $V = \frac{W}{Q}$ ✓

$$12 = W / 1 \quad \checkmark$$

$$W = 12 \, \text{J} \quad \checkmark$$

(3)

[11]

TOTAL: 80