Province of the
EASTERN CAPE
EDUCATION

DISTRICT JOE GQABI

PHYSICAL SCIENCES CONTROLLED TEST

MOMARANDUM

QUESTION 1

1.1 A√ √

1.2 B√ √

1.3 D√ √

1.4 C√ √

1.5 B√ √

1.6 B√ √

1.7 A√ √

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QUESTION 2

2.1 Pulse is a single disturbance in a medium√ √ (2)

2.2

2.2.1 Destructive interference√ (1)

2.2.2 Two pulses meet at a point and sum up to no pulse or smaller pulse√ √ (2)

2.2.3 amplitude of pulse L + (-7 cm) = -4 cm√

amplitude of pulse L = 3 cm√ (2)

2.2.4 TO THE LEFT√ (1)

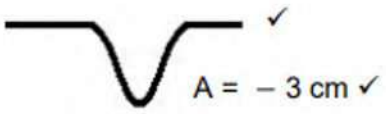
2.3

2.3.1 principle of superposition of pulses√

The algebraic sum of the amplitudes of two pulses that occupy the same space at the same time √ √

(3)

2.3.2 +5 cm + (-8 cm) = -3 cm√



(3)

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QUESTION 3

3.1

3.1.1 A wave in which the disturbance of particles is at right angle to the direction of propagation of wave.√ √ (2)

3.1.2 AE√ (1)

3.2

3.2.1 3 cm√ √ (2)

3.2.2 93,33 cm√ √ (2)

3.2.3 $v = f\lambda$ √

$f = \frac{18}{93,33}$ √ positive marking from Q. 3.2.2

$f = 0,19\ Hz$ √ (3)

3.2.4 $T = \frac{1}{f}$ √

$T = \frac{1}{0,19}$ √ positive marking from Q. 3.2.3

$T = 5,18\ s$ √ (3)

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QUESTION 4

4.1 a pulse in which the disturbance of particles is parallel to the direction of propagation.√ √ (2)

4.2

4.2.1 Rarefaction√

The region of low pressure in a longitudinal wave.√ √ (3)

4.2.2 Compression√

The region of high pressure in a longitudinal wave.√ √ (3)

4.3 The particles move forward and backward. (parallel to direction of propagation)√ √ (2)

4.4

4.4.1 $f=\frac{1}{T}$√

$f=\frac{410}{2}$√

$f=205\,Hz$√ (3)

4.4.2 $v=f\lambda$√

$v=205\times0,05$√ positive marking from Q. 4.2.1

$v=10,25\,m.s^{-1}$√ (3)

4.5

4.5.1 sound with frequencies higher than 20 000 Hz√ √ (2)

4.5.2 $v=f\lambda$√

$1\,480$√$=130\,000$√$\times\lambda$

$\lambda=0,01m$√ (4)

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QUESTION 5

5.1 light has wave and particle nature√ √ (2)

5.2

5.2.1 An energy packet of electromagnetic radiation√ √ (2)

5.2.2 $c = 3 \times 10^{8}\, m.s^{-1}$ √ (1)

5.2.3 $E = hf$ √

$$E = 6{,}63 \times 10^{-34}\ \frac{3 \times 10^{8}\ \surd}{5 \times 10^{-13}\ \surd}$$

$E = 3{,}98 \times 10^{-13}\, J$ √ (4)

5.3 LOWER ENERGY√

Ultraviolet light have lower frequency than gamma rays√ (2)

5.4 infrared waves√ (1)

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QUESTION 6

6.1.1 $Q = nqe$ √

$Q = 30 \times -1,6 \times 10^{-19}$ √

$Q = -4 \times 10^{-18} C$ √ (3)

6.1.2 principle of charge quantisation√

All charges in the universe have a multiple integer of charge of an electron

$-1,6 \times 10^{-19}$ √ √ (3)

6.2

6.2.1 unlike charges attract√ (1)

6.3

6.3.1 when the two charges sphere are in contact they:

- Share electrons evenly.√
- Acquire a new charge that is the same.√ (2)

6.3.2 The net charge of an isolated system remains the same during any physical process.√ √ (2)

6.3.3 $Q_{new} = \frac{Q_x + Q_y}{2}$

$Q_{new} = \frac{+4 \times 10^{-19} + (-4,8 \times 10^{-18})}{2}$ √

$Q_{new} = -2,2 \times 10^{-18} C$

$Q_f - Q_i = nqe$ √

$-2,2 \times 10^{-18} - 4 \times 10^{-19} = n \times -1,6 \times 10^{-19}$ √

$n = 16\, electrons$ √ (4)

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QUESTION 7

7.1

7.1.1 Maximum energy provided by a battery per unit charge passing through it.√ √ (2)

7.1.2 rate of flow of charge√ √ (2)

7.2

7.2.1 $I=\frac{Q}{\Delta t}\sqrt{}$

$2=\frac{Q}{120}\sqrt{}$

$Q=240C\sqrt{}$ (3)

7.2.2 $V=\frac{W}{Q}\sqrt{}$

$12=\frac{W}{240}\sqrt{}$

$W=2\,880J\sqrt{}$ (3)

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