

Education

KwaZulu-Natal Department of Education
REPUBLIC OF SOUTH AFRICA

PHYSICAL SCIENCES P1 (PHYSICS)

COMMON TEST

MARKING GUIDELINE

MARCH 2018

NATIONAL SENIOR CERTIFICATE

GRADE 10

MARKS: 50

N.B. This marking guideline consists of 4 pages.

GREENBURY

QUESTION 1

- 1.1 D ✓✓ (2)
1.2 C ✓✓ (2)
1.3 C ✓✓ (2)
1.4 D ✓✓ (2) [8]

QUESTION 2

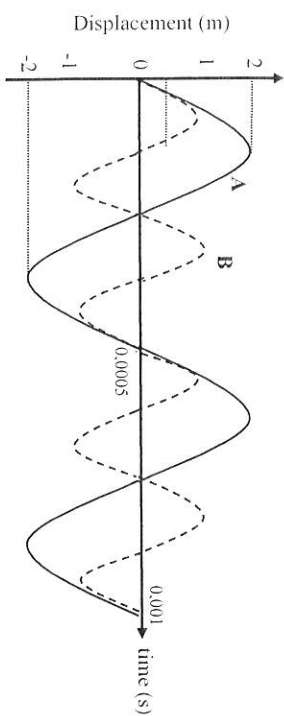
- 2.1 A single disturbance in a medium ✓✓ (2)
2.2 Destructive interference ✓ The resulting pulse is smaller than pulse B ✓ (2)
2.3 -3 cm ✓ (2)
2.4 Equal to ✓ only the amplitude of the wave is affected. ✓ (2) [8]

QUESTION 3

- 3.1 3.1.1 $T = 5 \times 10^{-4} \text{ s}$ ✓ (1)
3.1.2 The distance between consecutive points that are in phase ✓ (2)
3.1.3 One wave cycle ✓ (1)
3.1.4 $f = \frac{1}{T}$ ✓
 $= \frac{1}{5 \times 10^{-4}}$
 $= 2\,000 \text{ Hz}$ ✓ (2)
3.1.5 $v = f \cdot \lambda$ ✓
 $340 = (2000) \cdot \lambda$ ✓
 $\lambda = 0,17 \text{ m}$ ✓ (3)

3.6

3.6.1



Marking Criteria for Wave B

- 1 mark for amplitude of A double that of B
 1 mark for two complete cycles of B
 1 mark for ending at $t = 5 \times 10^{-4}$ s OR
 1 mark for four complete cycles of B and 1 mark ending at $t = 0,001$ s

3.6.2 Shorter than ✓

(1)
[13]

QUESTION 4

4.1 Echo ✓

(1)

4.2 $v = \frac{d}{t}$ ✓

OR

$$v = \frac{d}{t} \quad \checkmark$$

$$d = 345 \times 5 \times 10^{-3} \quad \checkmark \checkmark$$

$$= 1,725 \text{ m} \quad \checkmark$$

$$d = 345 \times 0,01 \quad \checkmark$$

$$= 3,45 \text{ m} \div 2 \quad \checkmark$$

$$= 1,725 \text{ m} \quad \checkmark$$

(4)

4.3 Bats produce high frequency sound waves ✓ or frequency of sound waves range between 20 000 Hz and 100 000 Hz. ✓

(1)

4.4 Sound waves travel faster through water than air. ✓

(1)
[7]

TOTAL MARKS: 50

QUESTION 5

5.1 Visible light ✓ OR sun ✓

(1)

5.2 Infrared ✓

(1)

5.3 Wave Z ✓ Wavelength is inversely proportional to frequency. ✓ OR Wave Z has the shortest wavelength. ✓

(2)

5.4 $v = f \cdot \lambda$ ✓

$$f = \frac{3 \times 10^8}{3 \times 10^{-7}} \quad \checkmark$$

$$f = 1 \times 10^{15} \text{ Hz} \quad \checkmark$$

(3)

5.5 A packet of energy found in light ✓ ✓

(2)

5.6 $E = \frac{hc}{\lambda}$ ✓

$$E = \frac{(6,63 \times 10^{-34})(3 \times 10^8)}{4 \times 10^{-10}} \quad \checkmark$$

$$= 4,9725 \times 10^{-16} \text{ J} \quad \checkmark$$

(4)

5.7 Gamma rays ✓

(1)
[14]